Munich Cancer Registry



- ▶ Survival
- ▶ Selection Matrix
- ▶ Homepage

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

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

Cancer statistics: Baseline statistics

C00: Lip cancer

Year of diagnosis	1998-2011
Patients	250
Diseases	250
Creation date	04/02/2013
Export date	01/03/2013
Population	4.5 m



http://www.tumorregister-muenchen.de/en/facts/base/base_C00__E.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.

Some remarks regarding this cancer type

As a general rule, these few results from the TRM form the basis of sophisticated analyses. For head and neck tumors this is not the case. Therefore the results for head and neck tumors should be interpreted with caution. In part this is due to problems of classification because of limited specific details of locality. Additionally, with advanced tumors in a close topographic location it is often not possible to determine the exact ICD localization of a tumor.

ICD-10 codes used for specifying cancer site

ICD-10	Description
C00 C00.0 C00.1 C00.2 C00.3 C00.4 C00.5 C00.6 C00.8 C00.9	Malignant neoplasm of lip External upper lip External lower lip External lip, unspecified Upper lip, inner aspect Lower lip, inner aspect Lip, unspecified, inner aspect Commissure of lip Overlapping lesion of lip Lip, 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

				Prop.		Prop.
		DCO	Prop.	mult.	Prop.	actively
Year of	Cases #	cases	DCO	primaries	deaths	followed
diagnosis	n	'n		୦	%	%
1998	18			44.4	50.0	94.4
1999	18			33.3	55.6	94.4
2000	9			44.4	77.8	100.0
2001	10			50.0	40.0	80.0
2002	32	2	6.3	43.8	53.1	100.0
2003	22	2	9.1	13.6	59.1	100.0
2004	17	1	5.9	58.8	47.1	94.1
2005	21			38.1	28.6	95.2
2006	9			55.6	55.6	88.9
2007	20	2	10.0	35.0	45.0	70.0 ##
2008	23			21.7	34.8	56.5
2009	17 /			41.2	29.4	64.7
2010	14			50.0	28.6	85.7
2011	20	1	5.0	35.0	15.0	75.0 ###
1998-2011	250	8	3.2	38.4	43.2	85.6

[#] 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	All	Males	Females	Prop. males	
diagnosis	n	n	n	%	
1998	18	12	6	66.7	
1999	18	/12	6	66.7	
2000	9	/ 8	1	88.9	
2001	10	8	2	80.0	
2002	32	21	11	65.6	
2003	22	/ 10	12	45.5	
2004	/ 17	12	5	70.6	
2005	/ 21	13	8	61.9	
2006	9	4	8 5	44.4	
2007	20	11	9	55.0	
2008	23	18	5	78.3	
2009	17	13	4	76.5	
2010	14	8	6	57.1	
2011	20	12	8	60.0	
1998-2011	250	162	88	64.8	

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)

			Males	Fem.	Males	Fem.	Males	Fem.	Males	Fem.
Year of	Males	Females	Inc.	Inc.	Inc.	Inc.	Inc.	Inc.	Inc.	Inc.
diagnosis	n	n	raw	raw	WS	WS	ES	ES	BRD-S	BRD-S
1998	12	6	1.1	0.5	0.8	0.2	1.0	0.3	1.1	0.4
1999	12	6	/1.1	0.5	0.6	0.2	1.0	0.3	1.5	0.4
2000	8	1	0.7	0.1	0.5	0.1	0.7	0.1	0.9	0.1
2001	8	2	0.7	0.2	0.4	0.1	0.6	0.1	0.7	0.1
2002	21	11	/ 1.1/	0.6	0.6	0.2	1.0	0.4	1.3	0.4
2003	10	12	0.5	0.6	0.3	0.2	0.4	0.3	0.6	0.5
2004	12	5 /	0.6	0.3	0.3	0.1	0.5	0.1	0.7	0.2
2005	13	8 <	0.7	0.4	0.4	0.2	0.5	0.2	0.7	0.3
2006	4	5	0.2	0.2	0.1	0.1	0.2	0.1	0.3	0.2
2007	11	9	0.5	0.4	0.2	0.1/	0.4	0.2	0.5	0.3
2008	18	5	0.8	0.2	0.4	0.1	0.6	0.1	0.8	0.2
2009	13	4	0.6	0.2	0.3	0.0	0.4	0.1	0.5	0.1
2010	8	6	0.4	0.3	0.2	0.1	0.3	0.1	0.4	0.2
2011	12	8	0.5	0.3	0.3	0.2	0.4	0.3	0.5	0.3
1998-2011	162	88	0.6	0.3	0.3	0.1	0.5	0.2	0.7	0.3



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	Cases		Std.					Median		
diagnosis	n	Mean	dev.	Min.	Max.	10%	25%	50%	75%	90%
1998	18	66.4	13.4	26.4	85.0	53.8	61.9	66.1	74.1	84.7
1999	18	73.4	10.9	55.0	86.8	55.6	62.3	76.9	80.8	85.8
2000	9	62.9	12.7	47,9	82.7	47.9	54.4	57.3	73.3	82.7
2001	10	70.6	15.6	54.4	94.9	54.4	62.4	64.6	87.4	94.9
2002	32	72.8	11.3	53.9	94.4	58.7	64.8	71.9	81.4	86.0
2003	22	72.3	14.0	41.7	94.5	51.3	62.3	74.8	84.3	87.3
2004	17	73.1	8.1	60.7	87.9	62.1	66.6	75.2	75.8	84.4
2005	21	69.5	13.5	36.9	99.0	53.7	62.6	72.0	78.1	81.9
2006	9	80.2	9.6	59.3	93.2	59.3	76.1	81.5	85.1	93.2
2007	20	73.3	10.2	43.7	84.3	60.1	68.1	76.0	80.7	82.8
2008	23	72.3	11.3	51.5	90.8	55.0	64.5	72.1	81.8	86.2
2009	17	73.6	12.1	45.8	88.3	53.1	67.3	74.2	82.6	87.7
2010	14	74.5	10.5	53.7	85.9	56.2	68.1	77.7	85.0	85.8
2011	20	65.5	13.9	34.0	90.5	50.0	57.5	63.6	77.2	84.0
1998-2011	250	71.5	12.3	26.4	99.0	54.6	63.7	72.9	80.9	85.9

Table 3a

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

Year of	Cases		Std.					Median		
diagnosis	n	Mean	dev.	Min.	Max.	10%	25%	50%	75%	90%
1998	12	61.9	12.2	26.4	74.1	54.4	61.9	64.5	67.8	69.8
1999	12	73.2	11.1	55.0	86.8	55.6	65.0	75.2	81.4	85.4
2000	8	64.0	13.2	47.9	82.7	47.9	52.8	61.9	75.9	82.7
2001	8	68.5	14.8	54.4	94.9	54.4	58.4	64.6	76.3	94.9
2002	21	72.2	9.4	53.9	86.0	62.2	65.8	72.6	79.4	85.7
2003	10	67.7	15.6	41.7	94.5	46.5	60.2	66.8	75.8	89.5
2004	12	71.7	8.0	60.7	87.9	62.1	65.7	71.9	75.7	80.9
2005	13	68.3	11.2	47.0	82.5	53.7	60.7	71.0	75.6	81.9
2006	4	76.7	11.8	59.3	85.1	59.3	70.0	81.1	83.3	85.1
2007	11	70.1	11.1	43.7	81.1	57.7	64.0	73.6	78.0	79.7
2008	18	69.8	11.0	51.5	86.2	52.1	64.3	68.7	78.7	83.8
2009	13	71.5	12.4	45.8	87.7	53.1	66.1	73.2	82.1	84.5
2010	8	75.1	10.3	56.2	85.9	56.2	67.8	78.8	82.6	85.9
2011	12	67.2	15.8	34.0	90.5	50.6	61.0	64.9	80.0	86.1
1998-2011	162	69.7	11.9	26.4	94.9	54.4	62.3	69.9	78.9	84.5

Table 3b

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

Year of	Cases		Std.					Median		
diagnosis	n	Mean	dev.	Min.	Max.	10%	25%	50%	75%	90%
1998	6	75.4	11.7	53.8	85.0	53.8	72.9	78.1	84.7	85.0
1999	6	73.6	11.7	55.9	85.8	55.9	62.3	79.0	79.7	85.8
2000	1	54.7		54.7	54.7	54.7	54.7	54.7	54.7	54.7
2001	2	79.1	22,2	63.5	94.8	63.5	63.5	79.1	94.8	94.8
2002	11	73.9	14.7	58.4	94.4	58.7	58.9	69.3	91.0	92.8
2003	12	76.1	12.0	48.5	90.0	63.8	68.5	78.3	85.4	87.3
2004	5	76.4	8.0	64.2	84.4	64.2	75.2	75.3	82.8	84.4
2005	8	71.5	17.3	36.9	99.0	36.9	67.5	72.2	78.3	99.0
2006	5	83.0	7.6	75.6	93.2	75.6	76.1	82.0	87.9	93.2
2007	9	77.2	7.8	62.5	84.3	62.5	76.9	80.5	81.8	84.3
2008	5	81.4	7.6	72.1	90.8	72.1	77.6	79.2	87.4	90.8
2009	4	80.4	9.2	68.2	88.3	68.2	73.3	82.5	87.5	88.3
2010	6	73.8	11.7	53.7	85.3	53.7	70.8	74.1	85.0	85.3
2011	8	62.8	11.0	49.4	79.1	49.4	53.7	61.4	71.8	79.1
1998-2011	88	74.7	12.3	36.9	99.0	56.5	66.1	76.9	84.3	88.3

Table 4

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

Age at									
diagnosis	Cases			Males			Females		
Years	n	%	Cum.%	n	96	Cum.%	n	%	Cum.%
25-29	1	0.4	0.4	1	0.6	0.6			0.0
30-34	1	0.4	0.8	/1	0.6	1.2			0.0
35-39	1	0.4	1.2			1.2	\ 1	1.1	1.1
40-44	2	0.8	2.0	/ 2	1.2	2.5			1.1
45-49	5	2.0	4.0	/ 3	1.9	4.3	2	2.3	3.4
50-54	17	6.8	10.8	13	8.0	12.3	4	4.5	8.0
55-59	16	6.4	17.2	10	6.2	18.5	6	6.8	14.8
60-64	31	12.4	29.6	24	14.8	33.3/	7	8.0	22.7
65-69	37	14.8	44.4	28	17.3	50.6	9	10.2	33.0
70-74	26	10.4	54.8	20	12.3	63.0	6	6.8	39.8
75-79	46	18.4	73.2	24	14.8	77.8	22	25.0	64.8
80-84	34	13.6	86.8	20	12.3	90.1	14	15.9	80.7
85+	33	13.2	100.0	16	9.9	100.0	17	19.3	100.0
All ages	250	100.0		162	100.0		88	100.0	

Included in the statistics are 58.6% multiple primaries in males and 43.2% in females.

Table 5

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

C	Age at diagnosis Years	Males n	Females n	Age- spec. incid.	incid.		Females DCO rate n=1 %		Females Prop.all cancers n=129521
	0 – 4 5 – 9			0.0	0.0				
-	10-14			0.0	0.0				
	15-19			0.0	0.0				
	20-24			0.0	0.0				
	25-29	1		0.1	0.0			0.1	
	30-34	1	-	0.1	0.0			0.1	0 0
	35-39	0	1	0.0	0.0			0 1	0.0
	40-44	2	2	0.1	0.0			0.1	0 0
	15-49 50-54	3 13	2 4	0.2	0.1 0.2	7.7		0.1 0.2	0.0
	50-54 55-59	10	6	0.6	0.2	1.1		0.2	0.0
	50-64	24	7	1.6	0.4	4.2		0.1	0.0
	55-69	28	9	2.1	0.6	1.2		0.1	0.1
	70-74	20	6	1.9	0.5	10.0		0.1	0.0
	75-79	24	22	3.6	2.2			0.1	0.1
8	30-84	20	14	4.9	1.8			0.2	0.1
8	35+	16	17	5.8	2.3	18.8	5.9	0.2	0.1
			\ \			4 2	1 1	\	
Z	All ages	162	88			4.3	1.1	0.1	0.1
		162	88			4.3	1.1	0.1	0.1
	Incidence	162	88	0.6	0.2	4.3	1.1	0.1	0.1
	Incidence Raw	162	88	0.6	0.3	4.3	1.1	0.1	0.1
	Incidence Raw WS	162	88	0.3	0.1	4.3	1.1	0.1	0.1
	Incidence Raw	162	88	0.3 0.5	0.1 0.2	4.3	1.1	0.1	0.1
	Incidence Raw WS ES	162	88	0.3	0.1	4.3	1.1	0.1	0.1
	Incidence Raw WS ES	162	88	0.3 0.5	0.1 0.2	4.3	1.1	0.1	0.1
	Incidence Raw WS ES	162	88	0.3 0.5	0.1 0.2	4.3	1.1	0.1	0.1
	Incidence Raw WS ES	162	88	0.3 0.5	0.1 0.2	4.3	1.1	0.1	0.1
	Incidence Raw WS ES	162	88	0.3 0.5	0.1 0.2	4.3	1.1	0.1	0.1
	Incidence Raw WS ES	162	88	0.3 0.5	0.1 0.2	4.3	1.1	0.1	0.1
	Incidence Raw WS ES	162	88	0.3 0.5	0.1 0.2	4.3		0.1	0.1
	Incidence Raw WS ES	162	88	0.3 0.5	0.1 0.2	4.3		0.1	0.1
	Incidence Raw WS ES	162	88	0.3 0.5	0.1 0.2	4.3		0.1	0.1
	Incidence Raw WS ES	162	88	0.3 0.5	0.1 0.2	4.3		0.1	0.1
	Incidence Raw WS ES	162	88	0.3 0.5	0.1 0.2	4.3		0.1	0.1
	Incidence Raw WS ES	162	88	0.3	0.1 0.2	4.3		0.1	0.1
	Incidence Raw WS ES	162	88	0.3	0.1 0.2	4.3		0.1	0.1
	Incidence Raw WS ES	162	88	0.3	0.1 0.2	4.3		0.1	0.1
	Incidence Raw WS ES	162	88	0.3	0.1 0.2	4.3		0.1	0.1
	Incidence Raw WS ES	162	88	0.3	0.1 0.2	4.3		0.1	0.1

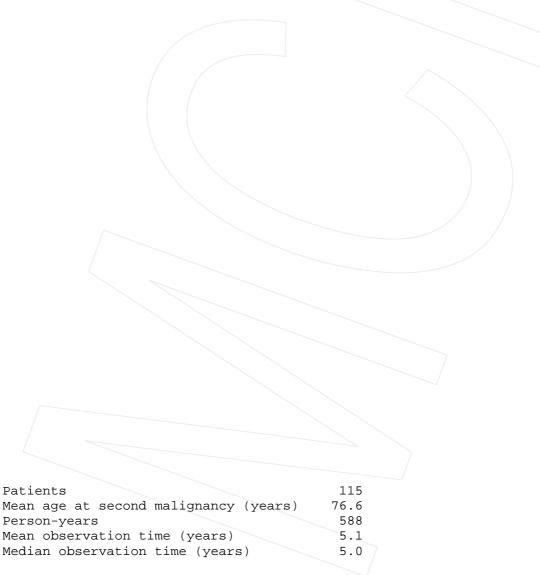
The age-specific incidence characterizes the disease risk in a particular age group. The age distribution depends on the patient population frequency in each age group and reflects the tangible clinical picture of everyday patients care (see following chart).

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

	Observed Ex	pected		LCL	UCL		DCO
Diagnosis	n	n	SIR	95%	95%	EAR	%
C16 Stomach	2	0.5	3.7	0.4	13.2	24.7	
C19-C20 Rectum	2	0.6	3.1	0.4	11.2	23.0	
C22 Liver	2	0.3	6.5	0.8	23.5	28.8	
C33-C34 Lung	10	1.4	7.3	3.5	13.5 #	146.9	10.0
Other primaries	5	5.1	1.0	0.3	2.3	-2.2	20.0
Not observed	0	3.8	0.0	0.0	1.0 #	-65.0	
All mult. primaries	21	11.8	1.8	1.1	2.7 #	156.2	9.5



The occurrence of second malignancy is statistically significant.

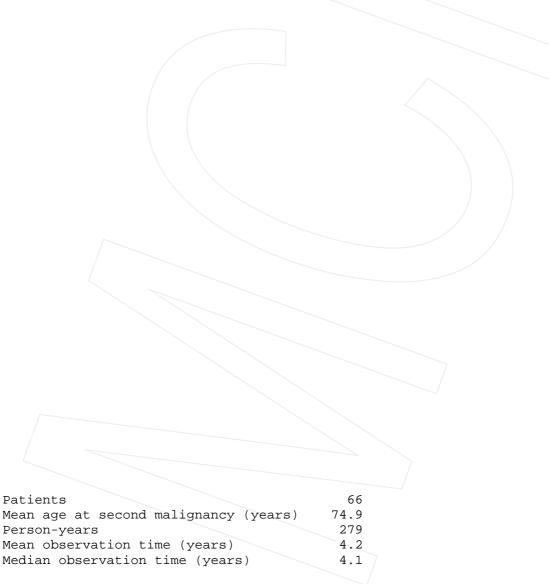
Observed second primaries with count 1 are pooled in category "Other primaries".

Table 6b

Standardized incidence ratio (SIR, with 95% confidence limits), excess absolute risk (EAR) and DCO rate of second primaries for period 1998-2011

FEMALES

Diagnosis	Observed n	Expected n	SIR	LCL 95%	UCL 95%	EAR	DCO %
C50 Breast C82-C85 NHL	3 2	1.1	2.8 12.4	0.6	8.2 44.8 #	69.3 65.8	
Other primaries Not observed	7 0	0.7 2.0	9.6	3.8	19.7 #	224.3 -73.3	
All mult. primaries	12	4.0	3.0	1.5	5.2 #	286.1	



The occurrence of second malignancy is statistically significant.

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

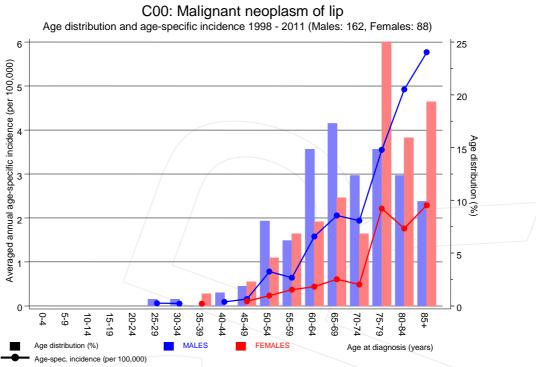


Figure 7. Age distribution and age-specific incidence



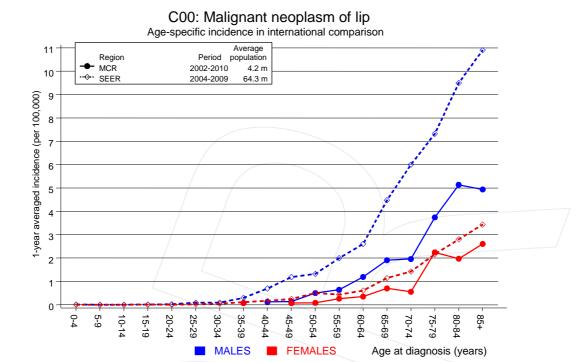


Figure 7a. Age-specific incidence in MCR registry areas compared to SEER (Surveillance, Epidemiology, and End Results, USA).



Reference:

Surveillance, Epidemiology, and End Results (SEER) Program SEER*Stat Database: Incidence - SEER 18 Regs Research Data, released April 2012, based on the November 2011 submission. http://www.seer.cancer.gov.

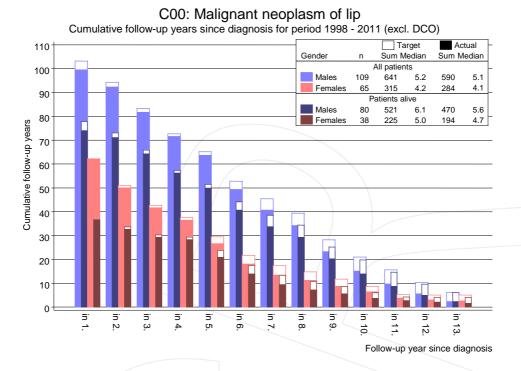
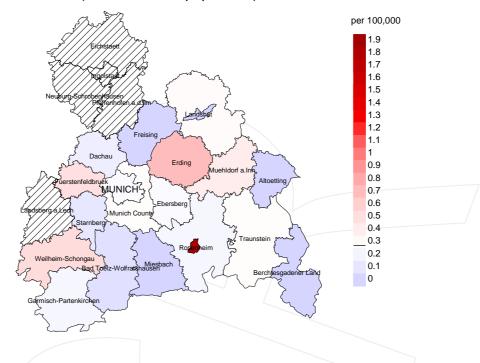


Figure 8. Cumulative follow-up years depending on time since diagnosis

The increase of the lost to follow-up rate can be interpreted as a consequence of a declining number of survivors over time.



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



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

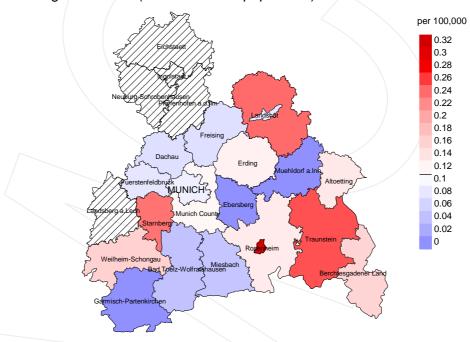
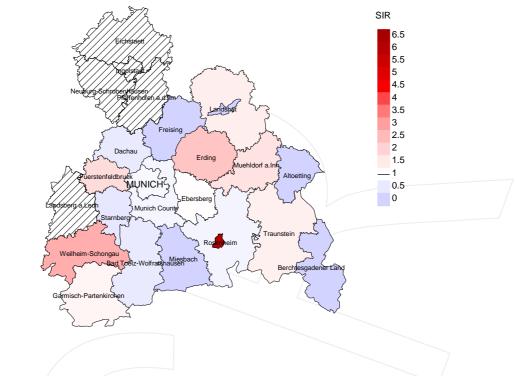


Figure 9a. Map of cancer incidence (world standard population, incl. DCO cases) by county averaged for period 2003 to 2008. According to their individual incidence rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (males 0.3/100,000 WS N=62, females 0.1/100,000 WS N=40). 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 0 women were identified with newly diagnosed lip cancer. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 0.0/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.0 and 1.4/100,000.

Standardized incidence ratio (SIR) 2003 - 2008: Males



Standardized incidence ratio (SIR) 2003 - 2008: Females

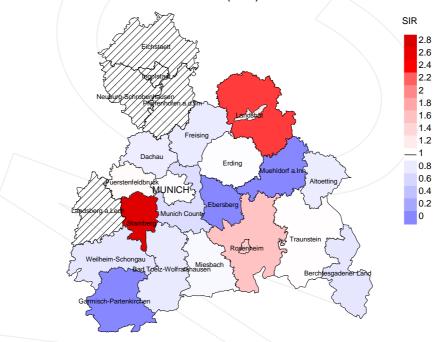


Figure 9b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2003 to 2008. According to their individual SIR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (males N=62, females N=40). 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 0 women were identified with newly diagnosed lip cancer. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 0.00. Though, the value of this parameter may vary with an underlying probability of 99% between 0.00 and 4.71, 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)

		Prop.				Prop. deaths
	Incident	actively	Prop.		Prop.	with death
Year of	cases	followed	DCO	Deaths	deaths	certific.
diagnosis	n	%	%	/ n /	%	%
1998	18	94.4		9	50.0	100.0
1999	18	94.4		10	55.6	90.0
2000	9	100.0		7	77.8	100.0
2001	10	80.0		4	40.0	100.0
2002	32	100.0	6.3	17	53.1	82.4
2003	22	100.0	9.1	13	59.1	100.0
2004	17	94.1	5.9	8	47.1	100.0
2005	21	95.2		6	28.6	100.0
2006	9	88.9		5	55.6	100.0
2007	20	70.0	10.0	9	45.0	100.0
2008	23	56.5		8	34.8	100.0
2009	17	64.7		5	29.4	100.0
2010	14	85.7		4	28.6	100.0
2011	20	75.0	5.0	3	15.0	100.0
1998-2011	250	85.6	3.2	108	43.2	96.3

Table 10b

Annual cohorts of incident cancers and deaths, proportion of death certificates and cases deceased the same year of cancer diagnosis (incl. DCO)

			Prop.		
			deaths		Prop.
Year of	Incident		with death	Deaths in	deaths in
diagnosis/	cases	Deaths	certific.	same year	same year
death	n	/ n /	8	n	%
1998	18	/ 8	100.0	1	5.6
1999	18	11	90.9		
2000	9	6	100.0		
2001	10	10	80.0	/ 1	10.0
2002	32	10	100.0	/ 3	9.4
2003	22	16	87.5	/ 1	4.5
2004	17	11	100.0	2	11.8
2005	21	16	100.0	1	4.8
2006	9	18	100.0	1	11.1
2007	20	14	100.0	1	5.0
2008	23	21	95.2	2	8.7
2009	/ 17	18	100.0	_ 1	5.9
2010	14 /	20	95.0	1	7.1
2011	20	13	100.0	2	10.0
1998-2011	250	192	96.4	17	6.8

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)

		Prop.	Prop.	Prop. cancer recorded	
		cancer-	not cancer-	on death	
Year of	Deaths	related	related	certificate	
death	n	%	8	%	
1998	8	37.5	62.5	62.5	
1999	11	54.5	45.5	60.0	
2000	6	83.3	16.7	83.3	
2001	10	30.0	70.0	50.0	
2002	10	70.0	30.0	80.0	
2003	16	31.3	68.8	28.6	
2004	11	72.7	27.3	81.8	
2005	16	25.0	75.0	43.8	
2006	18	38.9	61.1	44.4	
2007	14	50.0	50.0	64.3	
2008	21	28.6	71.4	40.0	
2009	18	33.3	66.7	38.9	
2010	20	35.0	65.0	42.1	
2011	13	46.2	53.8	69.2	
1998-2011	192	41.7	58.3	52.4	

Table 11a $\begin{tabular}{ll} \begin{tabular}{ll} \begin{tabula$

					Age at
		Age at	Age at	Age at	death
		death	death	death	(according
		(all	(cancer-	(not cancer-	to death
Year of	Deaths	causes)	related)	related)	certificate)
death	n	Years	Years	Years	Years
1998	6	71.3	77.5	68.1	71.5
1999	6	77.2	76.6	78.6	71.1
2000	5	75.7	73.9	82.8	73.9
2001	8	76.6	70.4	80.2	73.8
2002	9	79.6	80.5	76.5	80.5
2003	15	76.2	73.1	77.7	71.7
2004	9	80.9	79.8	84.7	79.5
2005	9	81.4	78.3	82.3	77.4
2006	9	77.6	71.4	82.6	71.4
2007	10	78.8	77.2	81.3	76.9
2008	13	80.3	83.3	79.0	83.1
2009	9	82.7	81.8	83.4	81.8
2010	15	76.0	71.0	79.3	72.9
2011	8	84.0	83.5	84.7	81.2
1998-2011	131	78.5	77.2	79.8	76.7

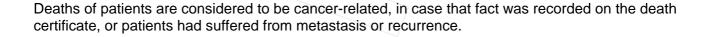


Table 11b Means of age at death according to the grouping in Table 10 FEMALES

					Age at
		Age at	Age at	Age at	death
		death	death	death	(according
		(all	(cancer-	(not cancer-	to death
Year of	Deaths	causes)	related)	related)	certificate)
death	n	Years	Years	Years	Years
1998	2	85.3	83.5	87.1	83.5
1999	5	80.0	81.0	79.3	82.7
2000	1	79.9	79.9		79.9
2001	2	84.5		84.5	
2002	1	91.0		91.0	91.0
2003	1	95.3		95.3	
2004	2	88.3	85.5	91.0	85.5
2005	7	86.2	77.1	89.9	77.1
2006	9	83.5	84.3	83.0	82.3
2007	4	80.8	67.4	85.2	67.4
2008	8	86.5	77.6	89.5	81.6
2009	9	80.8	73.8	82.8	81.8
2010	5	80.3	64.8	84.1	64.8
2011	5/	83.5	88.4	82.3	82.9
1998-2011	61	83.6	78.9	85.4	81.0



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 12a $\begin{tabular}{ll} Mortality measures (cancer-related death) and mortality-incidence-index \\ by year of death \\ \hline MALES \\ \end{tabular}$

Year of	Deaths	Mort.	MI-Index	Mort.	MI-Index	Mort.	MI-Index	Mort.	MI-Index
death	n	raw	raw	WS	WS	ES	ES	BRD-S	BRD-S
1998	2	0.2	0.17	0.1	0.14	0.2	0.18	0.2	0.19
1999	4	0.4	0.33	0.2	0.36	0.3	0.33	0.5	0.32
2000	4	0.4	0.50	0.2	0.40	0.3	0.45	0.5	0.57
2001	3	0.3	0.38	0.2	0.38	0.3	0.42	0.3	0.44
2002	7	0.4	0.33	0.2	0.28	0.3	0.33	0.5	0.40
2003	5	0.3	0.50	0.1	0.48	0.2	0.54	0.3	0.54
2004	7	0.4	0.58	0.2	0.51	0.3	0.63	0.5	0.73
2005	2	0.1	0.15	0.0	0.12	0.1	0.14	0.1	0.17
2006	4	0.2	1.00	0.1	1.12	0.2	0.95	0.2	0.95
2007	6	0.3	0.55	0.1	0.45	0.2	0.50	0.3	0.57
2008	4	0.2	0.22	0.1	0.18	0/.1	0.23	0.2	0.25
2009	4	0.2	0.31	0.0	0.18	0.1	0.24	0.2	0.38
2010	6	0.3	0.75	0.1	0.80	0.2	0.75	0.3	0.70
2011	5	0.2	0.42	0.1	0.28	0.2	0.37	0.2	0.41
1998-2011	63	0.3	0.39	0.1	0.33	0.2	0.38	0.3	0.43

Table 12b

Mortality measures (cancer-related death) and mortality-incidence-index by year of death

FEMALES

Year of	Deaths	Mort.	MI-Index	Mort.	MI-Index	Mort.	MI-Index	Mort.	MI-Index
death	n	raw	raw	WS	WS	ES	ES	BRD-S	BRD-S
1998	1	0.1	0.17	0.0	0.11	0.0	0.13	0.1	0.19
1999	2	0.2	0.33	0.0	0.20	0.1	0.25	0.1	0.28
2000	1	0.1	1.00	0.0	0.34	0.0	0.48	0.1	0.93
2001									
2002									
2003									
2004	1	0.1	0.20	0.0	0.14	0.0	0.17	0.0	0.12
2005	2	0.1	0.25	0.0	0.16	0.1	0.22	0.1	0.31
2006	3	0.1	0.60	0.0	0.85	0.1	0.74	0.1	0.64
2007	1	0.0	0.11	0.0	0.19	0.0	0.15	0.0	0.09
2008	2	0.1	0.40	0.0	0.44	0.0	0.47	0.1	0.56
2009	2	0.1	0.50	0.0	0.81	0.1	0.66	0.1	0.68
2010	1	0.0	0.17	0.0	0.34	0.0	0.27	0.0	0.21
2011	1	0.0	0.13	0.0	0.03	0.0	0.05	0.0	0.05
1998-2011	17	0.1	0.19	0.0	0.16	0.0	0.17	0.1	0.19

Table 13

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

Age at death	Cases		Ma	ales			Females		
Years	n	%	Cum.%	n	96	Cum.%	n	%	Cum.%
45-49	2	2.5	2.5	2	3.2	3.2			0.0
50-54	2	2.5	5.0	2	3.2	6.3			0.0
55-59	1	1.3	6.3	1	1.6	7.9			0.0
60-64	4	5.0	11.3	2	3.2	11.1	2	11.8	11.8
65-69	7	8.8	20.0	6	9.5	20.6	1	5.9	17.6
70-74	9	11.3	31.3	8	12.7	33.3	1	5.9	23.5
75-79	19	23.8	55.0	12	19.0	52.4	7	41.2	64.7
80-84	15	18.8	73.8	13	20.6	73.0/	2	11.8	76.5
85+	21	26.3	100.0	17	27.0	100.0	4	23.5	100.0
All ages	80	100.0		63	100.0		17	100.0	

Included in the statistics are 58.6% multiple primaries in males and 43.2% 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 Females	_ /	Females Age- spec. dex mortal. MI-inde	Males Females Prop.all Prop.all cancers cancers x % %
0- 4 5- 9 10-14 15-19 20-24 25-29		0.0 0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0 0.0	
30-34 35-39 40-44 45-49 50-54	2 2	0.0 0.0 0.0 0.1 0.6 0.1 0.1	5 0.0	0.1 0.1
55-59 60-64 65-69 70-74 75-79	1 2 2 6 1 8 1 12 7	0.1 0.1 0.1 0.0 0.4 0.2 0.8 0.4 1.8 0.5	8 0.1 0.29 1 0.1 0.11 0 0.1 0.17 0 0.7 0.32	0.0 0.0 0.1 0.1 0.0 0.1 0.0 0.1
80-84 85+ All ages	13 17 2 4 63 17	3.2 0.6 6.1 1.0		0.1 0.0 0.2 0.0 0.1 0.0
Mortality Raw WS ES BRD-S		0.3 0.3 0.1 0.3 0.2 0.3 0.3 0.4	3 0.0 0.16 8 0.0 0.17	
PYLL-70 per 100,000 ES AYLL-70		0.5 0.5 9.4	0.1 0.1 5.8	

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

Table 15a $\label{eq:multiple} \mbox{Multiple primaries in deaths in period 1998-2011} \mbox{MALES}$

Diagnosis	Total n	Total %↓	Pre n	Pre ←%	Syn- chron ±30d n	Syn- chron ±30d ←%	Post n	Post ←%
C00 Lip	1	1.3					1	100.0
C03-C06 Oral cavity	$\sqrt{2}$	2.5					2	100.0
C07-C08 Salivary gland	$\frac{2}{2}$	2.5					2	100.0
C09-C10 Oropharynx	/ 1	1.3	1	100.0			_	
C12-C13 Hypopharynx	/ 1	1.3	1	100.0				
C15 Oesophagus	/ 1 /	1.3					1	100.0
C16 Stomach	5	6.3	2	40.0			3	60.0
C18 Colon	4	5.1	2	50.0			2	50.0
C19-C20 Rectum	4	5.1	1	25.0			3	75.0
C22 Liver	1	1.3					1	100.0
C30-C31 Sinuses	1	1.3	1	100.0				
C32 Larynx	2	2.5	2	100.0				
C33-C34 Lung	19	24.1			1	5.3	18	94.7
C43 Malign. melanoma	1	1.3					1	100.0
C44 Skin others	15	19.0	3	20.0	1	6.7	1,1	73.3
C46,C49 Soft tissue	1	1.3	1	100.0				
C61 Prostate	9	11.4	5	55.6			4	44.4
C67 Bladder	3	3.8					3	100.0
C76-C79 CUP	1	1.3					1	100.0
C82-C85 NHL	3	3.8	2	66.7			1	33.3
C91-C96 Leukaemia	2	2.5					2	100.0
All mult. primaries	79	100.0	21	26.6	2	2.5	56	70.9

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

					Syn- chron	Syn- chron		
	Total	Total	Pre	Pre	±30d	±30d	Post	Post
Diagnosis	n /	%↓	n	←%	n	← %	n	← %
C07-C08 Salivary gland	1	6.3			\ 1	100.0		
C16 Stomach	/1	6.3	1	100.0				
C18 Colon	2	12.5					2	100.0
C19-C20 Rectum	2	12.5	1	50.0			1	50.0
C25 Pancreas	/ 1	6.3			1	100.0		
C30-C31 Sinuses	/ 1/	6.3					1	100.0
C43 Malign. melanoma	2	12.5					2	100.0
C44 Skin others	2	12.5			/ 1	50.0	1	50.0
C50 Breast	2	12.5			2	100.0		
C51 Vulva	1	6.3					1	100.0
C56 Ovary	1	6.3					1	100.0
All mult. primaries	16	100.0	2	12.5	5	31.3	9	56.3



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	_ /	MI-index	Females Age- spec. mortal.	MI-index	cancers	Females Prop.all cancers %
0- 4			0.0		0.0			
5- 9			0.0		0.0			
10-14			0.0		0.0			
15-19			0.0		0.0			
20-24			0.0		0.0			
25-29			0.0		0.0			
30-34			0.0		0.0			
35-39			0.0		0.0			
40-44			0.0		0.0			
45-49	1		0.1	0.50	0.0		0.1	
50-54	2		0.1	0.17	0.0		0.1	
55-59			0.0		0.0			
60-64	1	1	0.1	0.06	0.1	0.25	0.0	0.0
65-69	5	1	0.4	0.20	0.1	0.13	0.1	0.0
70-74	6		0.6	0.46	0.0		0.1	
75-79	11/	<u>/</u> 5	1.6		0.5	0.33	0.1	0.1
80-84	8	/ 1	2.0	0.73	0.1	0.10	0.1	0.0
85+	10	2	3.6	1.00	0.3	0.15	0.2	0.0
All ages	44	10					0.1	0.0
Mortality								
Raw			0.2	0.38	0.0	0.15		
WS			0.1		0.0	0.12		
ES			0.1	0.36	0.0	0.13		
BRD-S			0.2	0.43	0.0	0.15		
PYLL-70								
per 100,000			0.3		0.0			
ES			0.3		0.0			
AYLL-70			8.6		5.0			

^{*} See corresponding tables with multiple primaries.

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Table 17

Age-specific mortality (cancer-related) and proportion of all cancers for period 1999-2011

(Single primaries only *)

Age at death Years	Males n	Females	Males Age- spec. mortal.	MI-index	Females Age- spec. mortal.	MI-index	cancers	Females Prop.all cancers %
0 - 4			0.0		0.0			
5- 9			0.0		0.0			
10-14			0.0		0.0			
15-19			0.0		0.0			
20-24			0.0		0.0			
25-29 30-34			0.0		0.0			
35-39			0.0		0.0			
40-44			0.0		0.0			
45-49			0.0		0.0			
50-54	1		0.1	0.10	0.0		0.0	
55-59	_		0.0	0.10	0.0			
60-64			0.0		0.0			
65-69	2		0.2	0.10	0.0		0.0	
70-74	1 /		0.1	0.11	0.0		0.0	
75-79	3	3/	0.5	0.35	0.3	0.24	0.0	0.0
80-84	1		0.3	0.11	0.0		0.0	
85+	4	2	1.5	0.52	0.3	0.17	0.1	0.0
All ages	12	5					0.0	0.0
Mortality								
Raw			0.0	0.13	0.0	0.09		
WS			0.0	0.11	0.0	0.06		
ES			0.0	0.13	0.0	0.07		
BRD-S			0.1	0.15	0.0	0.09		
PYLL-70								
per 100,000			0.1					
ES			0.1					
AYLL-70			7.5					
 . -								

^{*} See corresponding tables with multiple primaries.

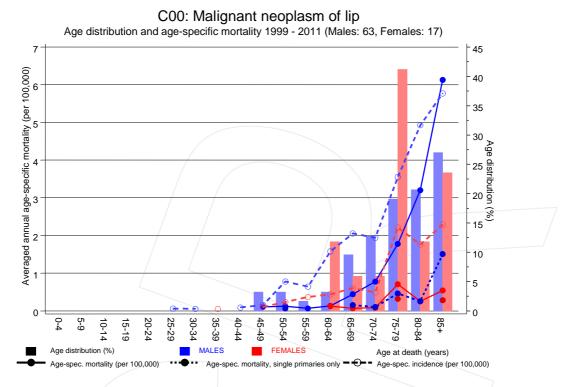
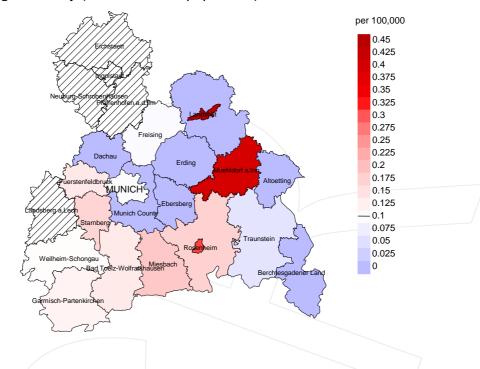


Figure 18. Distribution of age at death (bars) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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

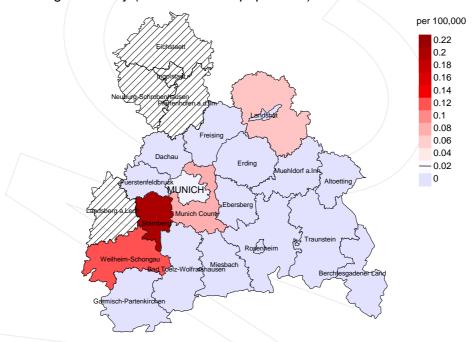


Figure 19a. Map of cancer mortality (world standard population) by county averaged for period 2003 to 2008. According to their individual mortality rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (males 0.1/100,000 WS N=26, females 0.0/100,000 WS N=9). 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 0 women died from lip cancer. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 0.0/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.0 and 1.4/100,000.

Standardized mortality ratio (SMR) 2003 - 2008: Males

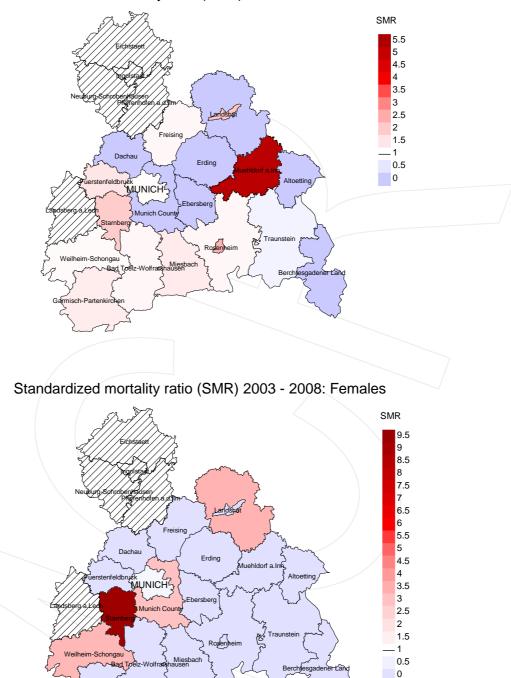


Figure 19b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2003 to 2008. According to their individual SMR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (males N=26, females N=9). 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 0 women died from lip cancer. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 0.00. Though, the value of this parameter may vary with an underlying probability of 99% between 0.00 and 21.02, 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

Fig./Tbl		Page
1	Pts cohorts, DCO, mult. prim., follow-up / yr	4
1a	Gender distribution by year of diagnosis	5
2	Incidence by year of diagnosis	6
3	Age distribution parameters by year of diagnosis	7
4	Age distribution by 5-year age group and gender	9
5	Age-specific incidence and DCO rate	10
6	Standardized incidence ratio of second primaries	11
7	Age distribution and age-specific incidence (chart)	13
7a	Age-specific incidence internationally (chart)	14
8	Cumulative follow-up years (chart)	15
9a	Map of cancer incidence (WS) by county (chart)	16
9b	Standardized incidence ratio (SIR) by county (chart)	17
10a	Pts incident cohorts and mortality / yr	18
10b	Incidence and mortality by year of diagnosis	19
10c	Cancer-related deaths, death certification available / yr	20
11	Means of age at death / yr	21
12	Mortality by year of death	23
13	Distribution of age at death	24
14	Age-specific mortality	25
15	Multiple primaries in deaths	26
16	Age-specific mortality (first primaries)	28
17	Age-specific mortality (single primaries)	29
18	Age distribution and age-specific mortality (chart)	30
19a	Map of cancer mortality (WS) by county (chart)	31
19b	Standardized mortality ratio (SMR) by county (chart)	32