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

C04: Floor of mouth cancer

Year of diagnosis	1998-2011
Patients	753
Diseases	753
Creation date	04/02/2013
Export date	01/03/2013
Population	4.5 m

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
C04.-	Malignant neoplasm of floor of mouth
C04.0	Anterior floor of mouth
C04.1	Lateral floor of mouth
C04.8	Overlapping lesion of floor of mouth
C04.9	Floor of mouth, 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	33	3	9.1	39.4	87.9	100.0	
1999	41	2	4.9	39.0	78.0	95.1	
2000	39	1	2.6	33.3	69.2	100.0	
2001	48	3	6.3	39.6	70.8	97.9	
2002	51	2	3.9	23.5	68.6	100.0	
2003	62	4	6.5	37.1	62.9	98.4	
2004	55	3	5.5	40.0	63.6	100.0	
2005	47	3	6.4	29.8	61.7	97.9	
2006	58	1	1.7	36.2	69.0	96.6	
2007	65	5	7.7	26.2	69.2	90.8	##
2008	61	3	4.9	34.4	60.7	80.3	
2009	76	3	3.9	30.3	46.1	78.9	
2010	82	6	7.3	20.7	34.1	90.2	
2011	35	3	8.6	25.7	31.4	74.3	###
1998-2011	753	42	5.6	31.9	60.6	92.3	

\#   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	33	29	4	87.9
1999	41	28	13	68.3
2000	39	34	5	87.2
2001	48	36	12	75.0
2002	51	37	14	72.5
2003	62	46	16	74.2
2004	55	47	8	85.5
2005	47	37	10	78.7
2006	58	48	10	82.8
2007	65	51	14	78.5
2008	61	44	17	72.1
2009	76	60	16	78.9
2010	82	64	18	78.0
2011	35	19	16	54.3
1998-2011	753	580	173	77.0

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	29	4	2.6	0.3	1.9	0.2	2.4	0.3	2.6	0.3
1999	28	13	2.5	1.1	1.6	0.6	2.2	0.9	2.3	0.9
2000	34	5	3.0	0.4	2.0	0.2	2.7	0.3	2.8	0.4
2001	36	12	3.1	1.0	2.0	0.6	2.8	0.8	3.1	0.8
2002	37	14	2.0	0.7	1.3	0.4	1.7	0.6	1.9	0.6
2003	46	16	2.5	0.8	1.6	0.5	2.2	0.7	2.3	0.8
2004	47	8	2.5	0.4	1.6	0.2	2.2	0.3	2.5	0.4
2005	37	10	2.0	0.5	1.2	0.3	1.6	0.4	1.9	0.4
2006	48	10	2.5	0.5	1.6	0.3	2.2	0.4	2.5	0.4
2007	51	14	2.3	0.6	1.5	0.3	2.0	0.5	2.2	0.5
2008	44	17	2.0	0.7	1.2	0.4	1.7	0.6	1.9	0.7
2009	60	16	2.7	0.7	1.7	0.4	2.3	0.5	2.4	0.6
2010	64	18	2.8	0.8	1.9	0.4	2.5	0.6	2.6	0.7
2011	19	16	0.8	0.7	0.5	0.4	0.7	0.5	0.8	0.6
1998-2011	580	173	2.3	0.7	1.5	0.4	2.0	0.5	2.2	0.6

The computation of the incidence measures includes all primaries, irrespective of first or subsequent malignancy.
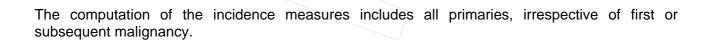
Table 3

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	33	55.3	13.4	0.9	80.5	45.4	49.6	56.5	58.6	70.8
1999	41	61.3	11.3	42.9	91.9	49.8	54.7	59.0	65.8	74.0
2000	39	56.8	10.4	39.1	85.8	44.0	49.1	57.2	63.3	72.6
2001	48	61.0	11.0	39.4	93.7	46.5	53.7	60.7	66.8	73.2
2002	51	60.6	11.4	39.1	99.0	46.7	52.5	60.5	66.4	75.1
2003	62	57.9	9.6	34.4	82.2	46.2	52.2	57.9	63.1	69.7
2004	55	59.5	10.1	39.4	81.9	46.1	52.6	59.3	66.1	74.5
2005	47	61.8	11.9	40.8	85.9	46.7	54.6	60.8	67.7	81.4
2006	58	60.3	10.8	34.7	91.4	48.0	52.9	58.8	66.7	76.4
2007	65	60.6	12.4	34.0	98.2	46.5	51.4	59.6	67.5	75.4
2008	61	62.5	12.0	41.2	100	49.2	53.4	61.8	69.5	79.4
2009	76	61.0	10.1	41.5	95.3	48.0	53.6	60.7	67.7	73.4
2010	82	58.7	10.6	29.9	87.5	45.2	51.4	59.7	66.9	69.8
2011	35	62.3	10.7	42.5	79.7	48.4	52.8	61.2	71.8	76.7
1998-2011	753	60.0	11.1	0.9	100	46.9	52.5	59.3	66.9	74.2

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	29	55.4	14.3	0.9	80.5	44.0	49.6	56.5	64.6	72.0
1999	28	59.7	11.4	42.9	90.8	45.1	53.6	58.0	62.5	74.0
2000	34	55.7	9.5	39.1	77.5	44.0	49.1	56.3	61.1	68.0
2001	36	59.6	11.4	39.4	93.7	45.4	51.6	60.0	64.9	73.2
2002	37	59.3	9.7	41.6	79.4	45.7	51.2	60.5	64.7	74.8
2003	46	57.9	9.8	34.4	82.2	43.8	52.2	57.9	63.1	71.1
2004	47	58.9	9.9	39.4	81.9	45.5	52.6	58.9	63.9	73.0
2005	37	60.4	11.8	40.8	85.0	44.6	52.1	58.2	66.9	77.2
2006	48	59.0	10.5	34.7	84.4	47.2	52.5	58.0	65.6	76.4
2007	51	59.4	10.6	42.6	87.0	46.5	50.5	57.1	67.1	73.3
2008	44	61.9	12.2	41.2	100	49.2	51.5	61.7	68.6	80.0
2009	60	59.9	9.4	41.5	87.9	47.7	53.1	59.4	67.3	71.7
2010	64	56.7	10.2	29.9	78.6	43.4	50.2	56.6	63.8	69.6
2011	19	60.5	12.1	42.5	79.7	46.9	50.3	58.0	73.9	78.4
1998-2011	580	58.8	10.8	0.9	100	45.7	51.4	58.2	65.7	73.1

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	4	54.7	4.4	49.6	58.6	49.6	51.0	55.2	58.3	58.6
1999	13	64.7	10.8	53.6	91.9	53.6	58.2	61.6	66.9	77.6
2000	5	64.3	14.2	48.5	85.8	48.5	57.1	60.6	69.7	85.8
2001	12	65.3	8.9	56.4	89.8	56.7	60.4	62.9	69.1	69.3
2002	14	63.9	14.8	39.1	99.0	50.7	54.6	61.2	74.8	77.2
2003	16	57.9	9.5	43.5	80.2	46.2	49.3	58.3	63.0	67.4
2004	8	63.2	11.4	47.4	78.9	47.4	52.9	64.7	71.9	78.9
2005	10	66.9	11.6	54.1	85.9	54.5	58.9	63.2	80.8	83.7
2006	10	66.5	10.6	56.0	91.4	56.2	58.8	63.8	71.2	83.1
2007	14	65.0	17.0	34.0	98.2	50.0	55.1	63.4	71.9	91.0
2008	17	63.9	11.8	46.2	89.0	48.8	54.3	62.7	70.0	79.4
2009	16	65.1	11.7	48.4	95.3	50.6	57.4	63.9	71.6	77.2
2010	18	65.9	8.5	49.9	87.5	53.8	62.0	66.3	68.3	79.4
2011	16	64.4	8.9	49.5	77.1	52.1	55.7	67.1	71.7	73.9
1998-2011	173	64.0	11.4	34.0	99.0	51.0	56.3	62.6	69.6	78.9

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	1	0.1	0.1	1	0.2	0.2			0.0
5-9	0	0.0	0.1			0.2			0.0
10-14	0	0.0	0.1			0.2			0.0
15-19	0	0.0	0.1			0.2			0.0
20-24	0	0.0	0.1			0.2			0.0
25-29	1	0.1	0.3	1	0.2	0.3			0.0
30-34	3	0.4	0.7	2	0.3	0.7	1	0.6	0.6
35-39	11	1.5	2.1	10	1.7	2.4	1	0.6	1.2
40-44	33	4.4	6.5	32	5.5	7.9	1	0.6	1.7
45-49	84	11.2	17.7	72	12.4	20.3	12	6.9	8.7
50-54	125	16.6	34.3	104	17.9	38.3	21	12.1	20.8
55-59	142	18.9	53.1	111	19.1	57.4	31	17.9	38.7
60-64	129	17.1	70.3	95	16.4	73.8	34	19.7	58.4
65-69	98	13.0	83.3	67	11.6	85.3	31	17.9	76.3
70-74	58	7.7	91.0	43	7.4	92.8	15	8.7	85.0
75-79	34	4.5	95.5	23	4.0	96.7	11	6.4	91.3
80-84	17	2.3	97.7	13	2.2	99.0	4	2.3	93.6
85+	17	2.3	100.0	6	1.0	100.0	11	6.4	100.0
All ages	753	100.0		580	100.0		173	100.0	

Included in the statistics are 41.4% multiple primaries in males and 37.0% 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=31 %	Females DCO rate n=11 %	Males Prop.all cancers n=132509 %	Females Prop.all cancers n=129521 %
0- 4	1		0.1	0.0	100.0		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	2	1	0.1	0.1			0.2	0.1
35-39	10	1	0.5	0.0			0.5	0.0
40-44	32	1	1.4	0.0			1.2	0.0
45-49	72	12	3.7	0.6	2.8		1.6	0.2
50-54	104	21	6.2	1.2	1.0		1.4	0.2
55-59	111	31	7.1	1.9	1.8	6.5	0.9	0.3
60-64	95	34	6.2	2.1	7.4	5.9	0.5	0.2
65-69	67	31	4.9	2.1	7.5	3.2	0.3	0.2
70-74	43	15	4.2	1.2	11.6		0.2	0.1
75-79	23	11	3.4	1.1	13.0	9.1	0.1	0.1
80-84	13	4	3.2	0.5	30.8	25.0	0.1	0.0
85+	6	11	2.2	1.5	16.7	36.4	0.1	0.1
All ages	580	173			5.3	6.4	0.4	0.1
Incidence								
Raw			2.3	0.7				
WS			1.5	0.4				
ES			2.0	0.5				
BRD-S			2.2	0.6				

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 %
C03-C06 Oral cavity	3	0.2	13.0	2.7	38.1	#	18.2	
C09-C10 Oropharynx	12	0.3	39.7	20.5	69.4	#	76.7	8.3
C12-C13 Hypopharynx	10	0.2	58.3	27.9	107.1	#	64.5	10.0
C15 Oesophagus	10	0.4	28.0	13.4	51.5	#	63.3	10.0
C18 Colon	3	1.4	2.1	0.4	6.2		10.3	
C19-C20 Rectum	4	1.0	4.0	1.1	10.1	#	19.6	
C22 Liver	5	0.4	11.2	3.6	26.0	#	29.9	
C32 Larynx	6	0.2	25.5	9.3	55.4	#	37.8	
C33-C34 Lung	28	2.0	13.7	9.1	19.8	#	170.3	10.7
C43 Malign. melanoma	2	0.7	2.8	0.3	10.0		8.4	
C61 Prostate	3	4.6	0.6	0.1	1.9		-10.8	
C64 Kidney	4	0.6	6.3	1.7	16.2	#	22.1	
C76-C79 CUP	2	0.3	7.5	0.9	27.1		11.4	
Other primaries	8	1.5	5.3	2.3	10.5	#	42.7	
Not observed	0	2.6	0.0	0.0	1.4		-17.1	
All mult. primaries	100	16.6	6.0	4.9	7.3	#	547.2	6.0

Patients	443
Mean age at second malignancy (years)	62.5
Person-years	1524
Mean observation time (years)	3.4
Median observation time (years)	2.4

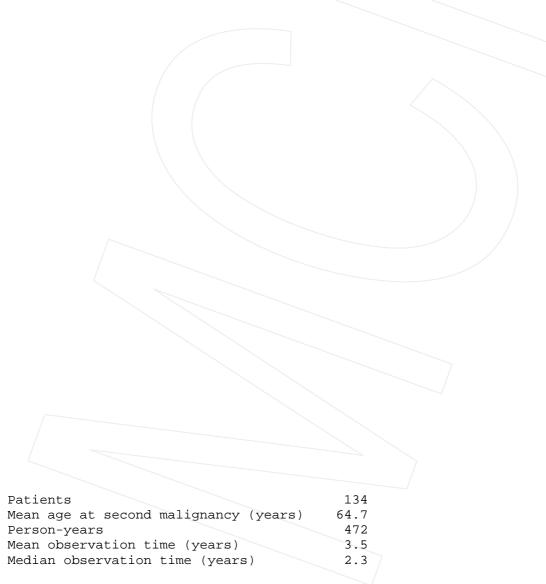# The occurrence of second malignancy is statistically significant.

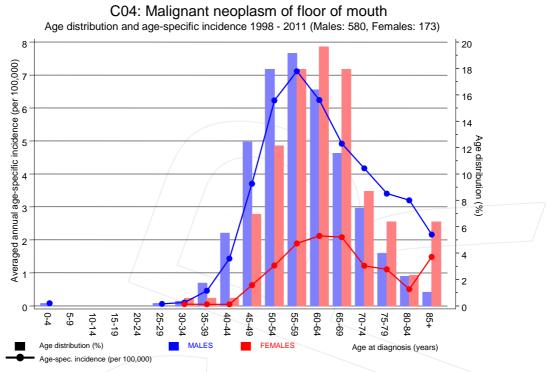Observed second primaries with count 1 are pooled in category "Other primaries".

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 %
C09-C10 Oropharynx	4	0.0	155.2	42.3	397.5	#	84.3	
C15 Oesophagus	2	0.0	71.1	8.6	256.8	#	41.8	
C33-C34 Lung	6	0.4	16.8	6.2	36.5	#	119.6	16.7
Other primaries	8	2.7	3.0	1.3	5.9	#	113.4	12.5
Not observed	0	1.7	0.0	0.0	2.1		-37.0	
All mult. primaries	20	4.8	4.2	2.5	6.4	#	322.1	10.0

Patients	134
Mean age at second malignancy (years)	64.7
Person-years	472
Mean observation time (years)	3.5
Median observation time (years)	2.3

The occurrence of second malignancy is statistically significant.

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

C04: Malignant neoplasm of floor of mouth
Age distribution and age-specific incidence 1998 - 2011 (Males: 580, Females: 173)

Figure 7. Age distribution and age-specific incidence

C04: Malignant neoplasm of floor of mouth
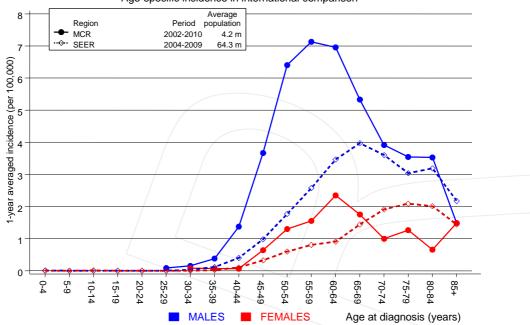### Age-specific incidence in international comparison

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.
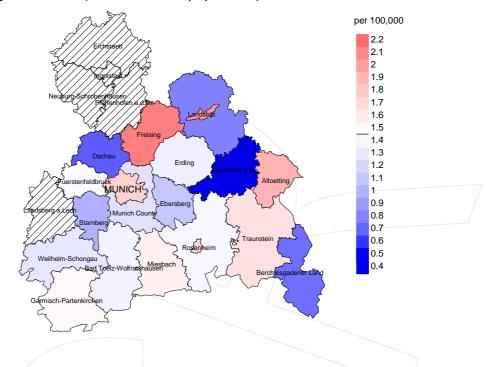
C04: Malignant neoplasm of floor of mouth
Cumulative follow-up years since diagnosis for period 1998 - 2011 (excl. DCO)

		Target			Actual	
Gender	n	Sum	Median		Sum	Median
All patients						
Males	420	1609	2.8		1552	2.8
Females	127	510	3.0		490	3.0
Patients alive						
Males	192	1072	5.2		1015	4.9
Females	73	387	4.5		367	4.3
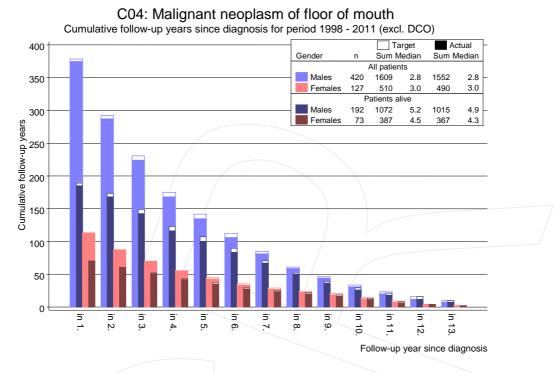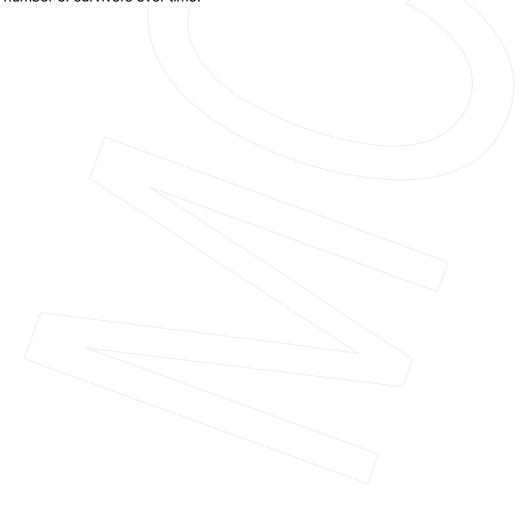
Figure 8. Cumulative follow-up years depending on time since diagnosis

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 1.5/100,000 WS N=262, females 0.4/100,000 WS N=73). 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 1 women were identified with newly diagnosed floor of mouth cancer. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 0.1/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.0 and 0.9/100,000.

Standardized incidence ratio (SIR) 2003 - 2008: Males

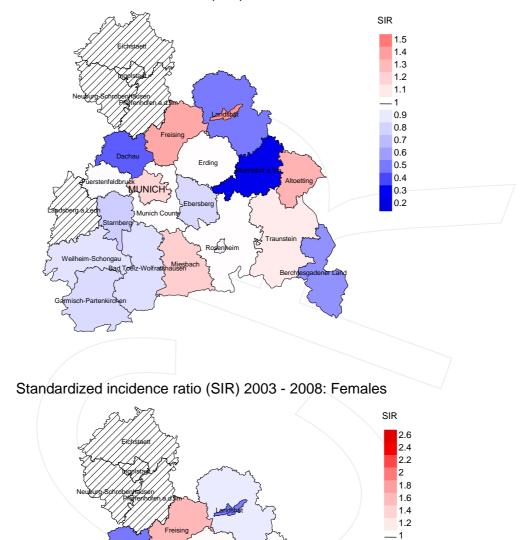## Standardized incidence ratio (SIR) 2003 - 2008: Females

Figure 9b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2003 to 2008. According to their individual SIR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (males N=262, females N=73). 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 1 women were identified with newly diagnosed floor of mouth cancer. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 0.45. Though, the value of this parameter may vary with an underlying probability of 99% between 0.00 and 3.35, 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	33	100.0	9.1	29	87.9	96.6
1999	41	95.1	4.9	32	78.0	84.4
2000	39	100.0	2.6	27	69.2	92.6
2001	48	97.9	6.3	34	70.8	97.1
2002	51	100.0	3.9	35	68.6	97.1
2003	62	98.4	6.5	39	62.9	97.4
2004	55	100.0	5.5	35	63.6	97.1
2005	47	97.9	6.4	29	61.7	96.6
2006	58	96.6	1.7	40	69.0	100.0
2007	65	90.8	7.7	45	69.2	97.8
2008	61	80.3	4.9	37	60.7	94.6
2009	76	78.9	3.9	35	46.1	100.0
2010	82	90.2	7.3	28	34.1	100.0
2011	35	74.3	8.6	11	31.4	90.9
1998-2011	753	92.3	5.6	456	60.6	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)
(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	33	27	96.3	9	27.3
1999	41	24	87.5	5	12.2
2000	39	25	92.0	5	12.8
2001	48	35	88.6	8	16.7
2002	51	49	98.0	6	11.8
2003	62	57	96.5	11	17.7
2004	55	44	93.2	12	21.8
2005	47	37	100.0	4	8.5
2006	58	39	100.0	2	3.4
2007	65	46	97.8	10	15.4
2008	61	52	98.1	9	14.8
2009	76	66	98.5	12	15.8
2010	82	63	100.0	11	13.4
2011	35	53	98.1	5	14.3
1998-2011	753	617	96.8	109	14.5

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	27	81.5	18.5	92.3
1999	24	66.7	33.3	95.2
2000	25	64.0	36.0	78.3
2001	35	80.0	20.0	96.8
2002	49	87.8	12.2	95.8
2003	57	82.5	17.5	92.7
2004	44	75.0	25.0	92.7
2005	37	86.5	13.5	91.9
2006	39	79.5	20.5	87.2
2007	46	73.9	26.1	88.9
2008	52	75.0	25.0	92.2
2009	66	83.3	16.7	90.8
2010	63	74.6	25.4	92.1
2011	53	71.7	28.3	84.6
1998-2011	617	78.0	22.0	91.0

Table 11a

Means of age at death according to the grouping in Table 10
MALES

Year of death	Deaths n	Age at death (all causes) Years	Age at death (cancer-related) Years	Age at death (not cancer-related) Years	Age at death (according to death certificate) Years
1998	24	60.0	58.0	73.9	59.0
1999	18	55.8	57.5	51.4	55.8
2000	19	64.5	62.1	68.6	63.0
2001	29	59.0	60.4	53.8	60.8
2002	37	62.3	61.3	67.4	61.0
2003	48	65.4	64.9	67.5	65.6
2004	35	60.0	58.8	63.9	60.4
2005	30	67.6	66.7	74.1	67.7
2006	31	64.7	63.9	69.1	64.6
2007	38	63.5	62.4	67.2	63.1
2008	42	65.0	64.3	67.3	64.3
2009	54	66.3	64.1	76.0	64.9
2010	51	64.3	62.7	68.9	64.0
2011	43	63.6	61.4	68.7	62.2
1998-2011	499	63.5	62.5	67.4	63.1

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.
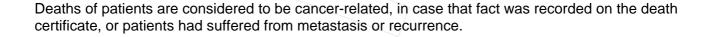
Table 11b

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	3	55.9	57.6	55.0	55.8
1999	6	76.9	72.2	81.6	72.9
2000	6	67.8	66.5	70.3	66.5
2001	6	71.8	73.6	62.8	73.6
2002	12	63.5	63.5		63.5
2003	9	67.3	68.3	59.5	68.3
2004	9	71.4	70.7	72.8	69.7
2005	7	70.6	68.2	85.1	68.2
2006	8	66.9	68.9	63.5	67.8
2007	8	68.7	71.2	64.6	68.7
2008	10	67.2	67.5	66.3	69.3
2009	12	70.9	70.9	70.5	70.9
2010	12	72.2	69.3	80.8	70.8
2011	10	73.8	74.9	69.4	73.1
1998-2011	118	69.3	69.2	69.9	69.1

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	21	1.9	0.72	1.3	0.71	1.7	0.72	1.9	0.73
1999	13	1.2	0.46	0.7	0.44	1.0	0.45	1.1	0.46
2000	12	1.1	0.35	0.7	0.33	0.9	0.35	1.1	0.38
2001	23	2.0	0.64	1.3	0.65	1.8	0.64	2.0	0.65
2002	31	1.7	0.84	1.1	0.81	1.5	0.84	1.6	0.84
2003	39	2.1	0.85	1.2	0.77	1.7	0.79	2.1	0.90
2004	27	1.4	0.57	1.0	0.58	1.2	0.56	1.4	0.56
2005	26	1.4	0.70	0.7	0.62	1.1	0.66	1.4	0.73
2006	26	1.4	0.54	0.8	0.50	1.1	0.51	1.3	0.53
2007	29	1.3	0.57	0.8	0.54	1.1	0.57	1.3	0.58
2008	32	1.4	0.73	0.9	0.71	1.2	0.71	1.3	0.72
2009	44	2.0	0.73	1.2	0.69	1.6	0.71	1.8	0.75
2010	38	1.7	0.59	1.1	0.56	1.4	0.58	1.5	0.59
2011	30	1.3	1.58	0.8	1.67	1.1	1.66	1.3	1.59
1998-2011	391	1.6	0.67	1.0	0.64	1.3	0.65	1.5	0.68

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	1	0.1	0.25	0.0	0.19	0.1	0.21	0.1	0.21
1999	3	0.3	0.23	0.1	0.20	0.2	0.21	0.2	0.21
2000	4	0.3	0.80	0.2	0.74	0.3	0.80	0.3	0.76
2001	5	0.4	0.42	0.2	0.30	0.2	0.32	0.3	0.39
2002	12	0.6	0.86	0.4	0.88	0.5	0.87	0.5	0.86
2003	8	0.4	0.50	0.2	0.39	0.3	0.42	0.4	0.48
2004	6	0.3	0.75	0.1	0.56	0.2	0.64	0.3	0.75
2005	6	0.3	0.60	0.2	0.66	0.2	0.63	0.2	0.59
2006	5	0.2	0.50	0.1	0.44	0.2	0.44	0.2	0.43
2007	5	0.2	0.36	0.1	0.32	0.2	0.32	0.2	0.34
2008	7	0.3	0.41	0.1	0.36	0.2	0.36	0.2	0.33
2009	11	0.5	0.69	0.2	0.55	0.3	0.57	0.3	0.57
2010	9	0.4	0.50	0.2	0.43	0.3	0.48	0.3	0.53
2011	8	0.3	0.50	0.1	0.35	0.2	0.37	0.2	0.41
1998-2011	90	0.3	0.52	0.2	0.45	0.2	0.47	0.3	0.48

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	0.2	0.2	1	0.3	0.3			0.0
5-9	0	0.0	0.2			0.3			0.0
10-14	0	0.0	0.2			0.3			0.0
15-19	0	0.0	0.2			0.3			0.0
20-24	0	0.0	0.2			0.3			0.0
25-29	0	0.0	0.2			0.3			0.0
30-34	0	0.0	0.2			0.3			0.0
35-39	4	0.8	1.0	4	1.0	1.3			0.0
40-44	10	2.1	3.1	9	2.3	3.6	1	1.1	1.1
45-49	27	5.6	8.7	27	6.9	10.5			1.1
50-54	58	12.0	20.7	51	13.0	23.5	7	7.8	8.9
55-59	79	16.4	37.1	65	16.6	40.1	14	15.6	24.4
60-64	98	20.3	57.5	80	20.4	60.5	18	20.0	44.4
65-69	84	17.4	74.9	71	18.1	78.6	13	14.4	58.9
70-74	56	11.6	86.5	43	11.0	89.5	13	14.4	73.3
75-79	31	6.4	92.9	24	6.1	95.7	7	7.8	81.1
80-84	17	3.5	96.5	13	3.3	99.0	4	4.4	85.6
85+	17	3.5	100.0	4	1.0	100.0	13	14.4	100.0
All ages	482	100.0		392	100.0		90	100.0	

Included in the statistics are 41.4% multiple primaries in males and 37.0% 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		0.1	1.00	0.0		3.4	
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			0.0		0.0			
30-34			0.0		0.0			
35-39	4		0.2	0.40	0.0		1.1	
40-44	9	1	0.4	0.28	0.0	1.00	1.2	0.1
45-49	27		1.4	0.38	0.0		1.8	
50-54	51	7	3.1	0.49	0.4	0.33	1.8	0.3
55-59	65	14	4.2	0.59	0.9	0.45	1.3	0.3
60-64	80	18	5.3	0.84	1.1	0.53	1.0	0.3
65-69	71	13	5.2	1.06	0.9	0.42	0.7	0.2
70-74	43	13	4.2	1.00	1.1	0.87	0.4	0.2
75-79	24	7	3.6	1.04	0.7	0.64	0.2	0.1
80-84	13	4	3.2	1.00	0.5	1.00	0.1	0.0
85+	4	13	1.4	0.67	1.8	1.18	0.1	0.1
All ages	392	90					0.6	0.1
Mortality								
Raw			1.6	0.68	0.3	0.52		
WS			1.0	0.64	0.2	0.45		
ES			1.3	0.65	0.2	0.47		
BRD-S			1.5	0.68	0.3	0.48		
PYLL-70								
per 100,000			15.5		2.2			
ES			14.2		1.9			
AYLL-70			11.5		9.3			

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	6	2.4					6	100.0
C09-C10 Oropharynx	34	13.8	13	38.2	9	26.5	12	35.3
C12-C13 Hypopharynx	20	8.1	8	40.0	1	5.0	11	55.0
C15 Oesophagus	21	8.5	4	19.0	6	28.6	11	52.4
C16 Stomach	4	1.6	1	25.0			3	75.0
C18 Colon	9	3.7	3	33.3	1	11.1	5	55.6
C19-C20 Rectum	6	2.4					6	100.0
C22 Liver	8	3.3	2	25.0	1	12.5	5	62.5
C32 Larynx	12	4.9	5	41.7	1	8.3	6	50.0
C33-C34 Lung	62	25.2	6	9.7	5	8.1	51	82.3
C43 Malign. melanoma	4	1.6	2	50.0			2	50.0
C44 Skin others	17	6.9	7	41.2			10	58.8
C61 Prostate	10	4.1	7	70.0	1	10.0	2	20.0
C62 Testis	3	1.2	3	100.0				
C64 Kidney	5	2.0	1	20.0			4	80.0
C67 Bladder	6	2.4	4	66.7			2	33.3
C70-C72 CNS cancer	2	0.8					2	100.0
C76-C79 CUP	5	2.0	3	60.0			2	40.0
C81 Hodgkin lymphoma	2	0.8	1	50.0			1	50.0
C82-C85 NHL	3	1.2	1	33.3	1	33.3	1	33.3
Other primaries	7	2.8	3	42.9			4	57.1
All mult. primaries	246	100.0	74	30.1	26	10.6	146	59.3

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 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 ←%
C03-C06	Oral cavity	3	6.5					3	100.0
C09-C10	Oropharynx	9	19.6	1	11.1	3	33.3	5	55.6
C12-C13	Hypopharynx	1	2.2					1	100.0
C15	Oesophagus	2	4.3					2	100.0
C16	Stomach	2	4.3					2	100.0
C18	Colon	4	8.7	4	100.0				
C22	Liver	1	2.2					1	100.0
C23-C24	Bile	1	2.2					1	100.0
C25	Pancreas	1	2.2					1	100.0
C30-C31	Sinuses	2	4.3					2	100.0
C32	Larynx	1	2.2	1	100.0				
C33-C34	Lung	7	15.2					7	100.0
C44	Skin others	2	4.3	1	50.0			1	50.0
C50	Breast	3	6.5	3	100.0				
C51	Vulva	1	2.2	1	100.0				
C53	Cervix uteri	4	8.7	4	100.0				
C56	Ovary	1	2.2					1	100.0
C82-C85	NHL	1	2.2			1	100.0		
All mult. primaries		46	100.0	15	32.6	4	8.7	27	58.7

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			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	4		0.2	0.44	0.0		1.2	
40-44	9	1	0.4	0.29	0.0	1.00	1.3	0.1
45-49	25		1.3	0.38	0.0		1.8	
50-54	40	5	2.4	0.49	0.3	0.29	1.6	0.2
55-59	53	10	3.4	0.62	0.6	0.40	1.2	0.3
60-64	61	14	4.0	0.76	0.9	0.48	0.9	0.3
65-69	54	11	4.0	1.08	0.7	0.46	0.6	0.2
70-74	33	11	3.2	1.03	0.9	1.10	0.4	0.2
75-79	19	7	2.8	1.12	0.7	0.78	0.2	0.1
80-84	8	4	2.0	1.14	0.5	1.00	0.1	0.1
85+	3	9	1.1	0.75	1.2	1.13	0.1	0.1
All ages	309	72					0.6	0.1
Mortality								
Raw			1.2	0.66	0.3	0.51		
WS			0.8	0.62	0.1	0.43		
ES			1.0	0.64	0.2	0.45		
BRD-S			1.2	0.67	0.2	0.48		
PYLL-70								
per 100,000			12.7		1.7			
ES			11.4		1.4			
AYLL-70			11.8		9.1			

* 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			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	4		0.2	0.57	0.0		1.2	
40-44	9	1	0.4	0.32	0.0	1.00	1.4	0.1
45-49	20		1.0	0.35	0.0		1.5	
50-54	28	5	1.7	0.42	0.3	0.31	1.2	0.3
55-59	35	9	2.2	0.49	0.5	0.47	0.9	0.3
60-64	36	9	2.4	0.55	0.6	0.36	0.6	0.2
65-69	29	5	2.1	0.67	0.3	0.28	0.4	0.1
70-74	19	7	1.8	0.76	0.6	0.70	0.3	0.1
75-79	14	4	2.1	0.82	0.4	0.50	0.2	0.1
80-84	7	4	1.7	1.00	0.5	1.00	0.1	0.1
85+	3	8	1.1	1.00	1.1	1.14	0.1	0.1
All ages	204	52					0.4	0.1
Mortality								
Raw			0.8	0.52	0.2	0.43		
WS			0.5	0.49	0.1	0.36		
ES			0.7	0.51	0.1	0.38		
BRD-S			0.8	0.53	0.2	0.40		
PYLL-70								
per 100,000			9.2		1.4			
ES			8.2		1.2			
AYLL-70			13.0		10.6			

* See corresponding tables with multiple primaries.

C04: Malignant neoplasm of floor of mouth
Age distribution and age-specific mortality 1998 - 2011 (Males: 391, Females: 90)
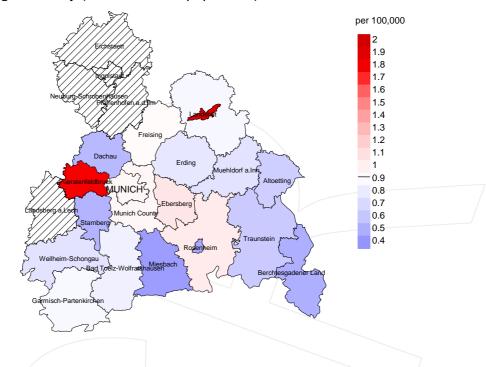
Figure 18. Distribution of age at death (bars) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

The difference between age at diagnosis (Table 3) and age at floor of mouth cancer-related death (see Table 10) should be considered.

Average mortality (world standard population) 2003 - 2008: Males
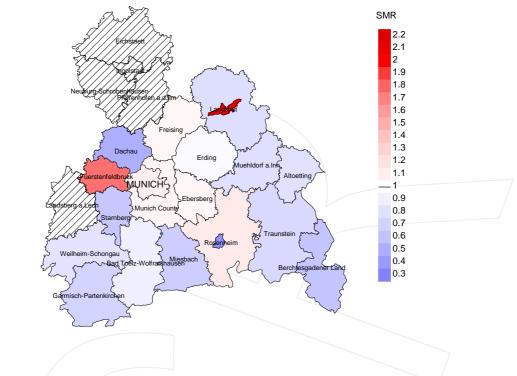
Average mortality (world standard population) 2003 - 2008: Females

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 0.9/100,000 WS N=176, females 0.2/100,000 WS N=37). 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 floor of mouth 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

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=176, females N=37). 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 floor of mouth 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 4.80, 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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