Munich Cancer Registry

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ICD-10 C04: Floor of mouth cancer

Incidence and Mortality

Year of diagnosis	1998-2014
Patients	921
Diseases	922
Creation date	04/13/2016
Export date	12/23/2015
Population	4.64 m

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

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

http://www.tumorregister-muenchen.de/en/facts/base/bC04__E-ICD-10-C04-Floor-of-mouth-cancer-incidence-and-mortality.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 4.64 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.

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 2016

[#] 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).

[##] 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.

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 (ICD-10 2015) used for specifying cancer site

Code	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

All patients with invasive cancer by year of diagnosis, proportions of DCO, multiple primaries, deaths, and active follow-up (incl. DCO)

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	42	2	4.8	42.9	83.3	92.9	
2000	40	1	2.5	35.0	70.0	100.0	
2001	47	3	6.4	42.6	74.5	93.6	
2002	52	2	3.8	30.8	73.1	100.0	#
2003	63	5	7.9	41.3	69.8	96.8	
2004	56	3	5.4	42.9	71.4	98.2	
2005	47	3	6.4	38.3	66.0	97.9	
2006	60	1	1.7	38.3	68.3	96.7	
2007	65	5	7.7	30.8	70.8	86.2	#
2008	63	3	4.8	36.5	60.3	73.0	
2009	78	3	3.8	32.1	56.4	82.1	
2010	88	6	6.8	29.5	51.1	75.0	
2011	45	3	6.7	35.6	44.4	68.9	
2012	66	5	7.6	27.3	42.4	77.3	
2013	62	5	8.1	19.4	32.3	100.0	
2014	15	6	40.0	33.3	53.3	100.0	##
1998-2014	922	59	6.4	34.4	61.8	88.8	

The increases of incident cases in 2002 and 2007 reflect the expansion to additional registry areas.

Please be aware that data of recent annual patient cohorts may not yet be fully processed. The years under evaluation can be found in the respective headings.

Table 1a

All patients with invasive cancer
by year of diagnosis and gender
(incl. DCO)

Year of diagnosis	All n	Males n	Females n	Prop. males %
1998	33	29	4	87.9
1999	42	29	13	69.0
2000	40	35	5	87.5
2001	47	35	12	74.5
2002	52	38	14	73.1
2003	63	47	16	74.6
2004	56	47	9	83.9
2005	47	37	10	78.7
2006	60	50	10	83.3
2007	65	51	14	78.5
2008	63	47	16	74.6
2009	78	61	17	78.2
2010	88	68	20	77.3
2011	45	28	17	62.2
2012	66	43	23	65.2
2013	62	49	13	79.0
2014	15	9	6	60.0
1998-2014	922	703	219	76.2

Table 2

Incidence measures by year of diagnosis including DCO cases
(with respect to registry area expansion from 2.51 to 3.96 m as of 2002,
and from 3.96 to 4.64 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	29	13	2.6	1.1	1.7	0.6	2.3	0.9	2.4	0.9
2000	35	5	3.1	0.4	2.1	0.2	2.8	0.3	2.9	0.4
2001	35	12	3.0	1.0	2.0	0.6	2.7	0.8	3.0	0.8
2002	38	14	2.0	0.7	1.3	0.4	1.8	0.6	2.0	0.6
2003	47	16	2.5	0.8	1.6	0.5	2.3	0.7	2.4	0.8
2004	47	9	2.5	0.5	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	50	10	2.6	0.5	1.7	0.3	2.4	0.4	2.6	0.4
2007	51	14	2.3	0.6	1.5	0.3	2.0	0.5	2.2	0.5
2008	47	16	2.1	0.7	1.3	0.4	1.8	0.5	2.0	0.6
2009	61	17	2.7	0.7	1.7	0.4	2.4	0.6	2.5	0.7
2010	68	20	3.0	0.9	2.0	0.5	2.6	0.6	2.8	0.7
2011	28	17	1.2	0.7	0.7	0.4	1.0	0.5	1.1	0.6
2012	43	23	1.9	1.0	1.2	0.6	1.6	0.8	1.7	0.8
2013	49	13	2.1	0.6	1.3	0.3	1.8	0.4	2.0	0.4
2014	9	6	0.4	0.3	0.2	0.1	0.3	0.1	0.4	0.2
1998-2014	703	219	2.2	0.7	1.4	0.4	1.9	0.5	2.1	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 patients)
(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	42	61.0	11.3	42.9	91.9	49.8	54.5	58.9	65.8	74.0
2000	40	56.7	10.3	39.1	85.8	44.3	49.5	57.2	62.2	71.1
2001	47	61.0	11.1	39.4	93.7	46.5	53.5	60.7	68.0	73.2
2002	52	60.1	11.7	38.0	99.0	45.7	51.9	60.4	66.1	75.1
2003	63	57.8	9.6	34.4	82.2	46.2	51.9	57.8	63.1	69.7
2004	56	60.0	10.6	39.4	84.8	46.1	52.8	59.6	66.8	75.0
2005	47	61.8	11.9	40.8	85.9	46.7	54.6	60.8	67.7	81.4
2006	60	60.0	10.7	34.7	91.4	48.2	52.9	58.6	66.5	75.6
2007	65	60.6	12.4	34.0	98.2	46.5	51.4	59.6	67.5	75.4
2008	63	62.9	11.7	41.2	100	49.2	53.4	62.4	69.5	79.4
2009	78	61.1	9.8	41.5	95.3	48.4	53.8	60.7	67.6	73.4
2010	88	59.1	10.9	29.9	90.9	45.2	51.5	59.9	67.2	70.9
2011	45	62.0	10.7	42.5	79.7	49.2	52.8	58.2	71.8	76.7
2012	66	61.2	10.2	43.7	100	48.0	51.7	62.2	67.3	72.2
2013	62	62.4	10.5	44.8	90.5	50.3	54.7	60.5	70.1	75.8
2014	15	67.8	13.0	43.9	90.0	51.1	59.5	64.4	78.1	88.4
1998-2014	922	60.5	11.1	0.9	100	47.6	52.5	59.6	67.4	74.4

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	29	59.3	11.3	42.9	90.8	45.1	52.8	57.7	62.3	74.0
2000	35	55.6	9.4	39.1	77.5	44.0	49.1	55.5	61.1	68.0
2001	35	59.5	11.5	39.4	93.7	45.4	50.8	59.7	65.6	73.2
2002	38	58.8	10.2	38.0	79.4	45.2	51.2	60.4	64.7	74.8
2003	47	57.7	9.7	34.4	82.2	43.8	52.2	57.8	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	50	58.7	10.3	34.7	84.4	47.6	52.5	57.4	64.9	73.9
2007	51	59.4	10.6	42.6	87.0	46.5	50.5	57.1	67.1	73.3
2008	47	62.3	11.8	41.2	100	49.2	51.6	62.2	68.3	80.0
2009	61	60.2	9.1	41.5	87.9	48.0	53.8	59.6	67.0	71.3
2010	68	57.0	10.2	29.9	78.6	43.4	50.8	56.9	64.6	69.8
2011	28	60.4	11.1	42.5	79.7	47.6	52.3	57.4	71.7	77.3
2012	43	60.0	9.2	43.7	79.5	48.0	51.4	62.3	67.3	70.5
2013	49	61.1	9.0	45.2	78.6	49.4	54.7	59.9	68.3	75.0
2014	9	63.5	13.2	43.9	90.0	43.9	58.4	63.1	67.6	90.0
1998-2014	703	59.2	10.5	0.9	100	46.5	51.7	58.6	66.3	73.0

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	9	65.6	12.9	47.4	84.8	47.4	54.2	68.1	75.5	84.8
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	16	64.6	11.9	46.2	89.0	48.8	54.8	64.7	72.4	79.4
2009	17	64.7	11.5	48.4	95.3	50.6	58.2	63.0	68.9	77.2
2010	20	66.3	10.5	49.9	90.9	52.2	61.7	66.3	68.9	83.5
2011	17	64.5	9.7	49.5	77.1	51.6	55.1	69.7	71.8	75.4
2012	23	63.3	11.9	45.5	100	49.9	55.4	62.2	72.2	72.7
2013	13	67.0	14.5	44.8	90.5	51.3	55.7	67.6	74.0	88.3
2014	6	74.4	10.2	63.1	88.4	63.1	64.4	74.2	82.2	88.4
1998-2014	219	64.6	11.8	34.0	100	50.6	56.3	63.3	71.7	80.8

Table 4

Age distribution by 5-year age group and gender for period 2007-2014
(incl. DCO)

Age at diagnosis Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
25-29	1	0.2	0.2	1	0.3	0.3			0.0
30-34	1	0.2	0.4			0.3	1	0.8	0.8
35-39	2	0.4	0.8	2	0.6	0.8			0.8
40-44	16	3.3	4.1	15	4.2	5.1	1	0.8	1.6
45-49	53	11.0	15.1	43	12.1	17.1	10	7.9	9.5
50-54	80	16.6	31.7	67	18.8	36.0	13	10.3	19.8
55-59	75	15.6	47.3	56	15.7	51.7	19	15.1	34.9
60-64	78	16.2	63.5	59	16.6	68.3	19	15.1	50.0
65-69	77	16.0	79.5	55	15.4	83.7	22	17.5	67.5
70-74	54	11.2	90.7	35	9.8	93.5	19	15.1	82.5
75-79	25	5.2	95.9	16	4.5	98.0	9	7.1	89.7
80-84	6	1.2	97.1	3	0.8	98.9	3	2.4	92.1
85+	14	2.9	100.0	4	1.1	100.0	10	7.9	100.0
All ages	482	100.0		356	100.0		126	100.0	

Included in the statistics are 42.1% multiple primaries in males and 29.4% in females.

Table 5

Age-specific incidence, DCO rate and proportion of all cancers
for period 2007-2014

Age at diagnosis Years	Males n	Females n	Males Age-spec. incid.	Females Age-spec. incid.	Males DCO rate n=25 %	Females DCO rate n=11 %	Males Prop.all cancers n=91183 %	Females Prop.all cancers n=89596 %
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	1		0.1	0.0			0.2	
30-34		1	0.0	0.1				0.1
35-39	2		0.2	0.0			0.2	
40-44	15	1	0.9	0.1			0.8	0.0
45-49	43	10	2.7	0.7			1.3	0.2
50-54	67	13	5.2	1.0	1.5		1.4	0.2
55-59	56	19	5.3	1.7	7.1	15.8	0.8	0.3
60-64	59	19	6.0	1.8	5.1	5.3	0.5	0.2
65-69	55	22	5.7	2.1	10.9	4.5	0.4	0.2
70-74	35	19	3.8	1.8	17.1		0.2	0.2
75-79	16	9	2.9	1.3	18.8		0.1	0.1
80-84	3	3	0.9	0.5		33.3	0.0	0.0
85+	4	10	1.7	1.7	50.0	50.0	0.1	0.1
All ages	356	126			7.0	8.7	0.4	0.1
Incidence								
Raw			2.0	0.7				
WS			1.2	0.4				
ES			1.7	0.5				
BRD-S			1.8	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).

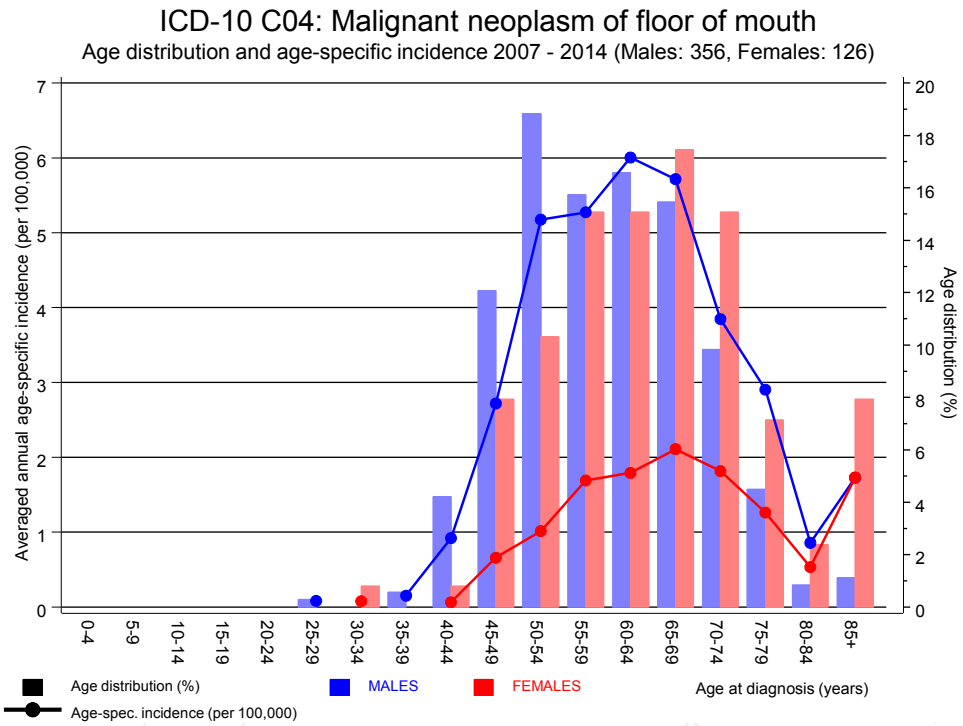


Figure 6. Age distribution and age-specific incidence

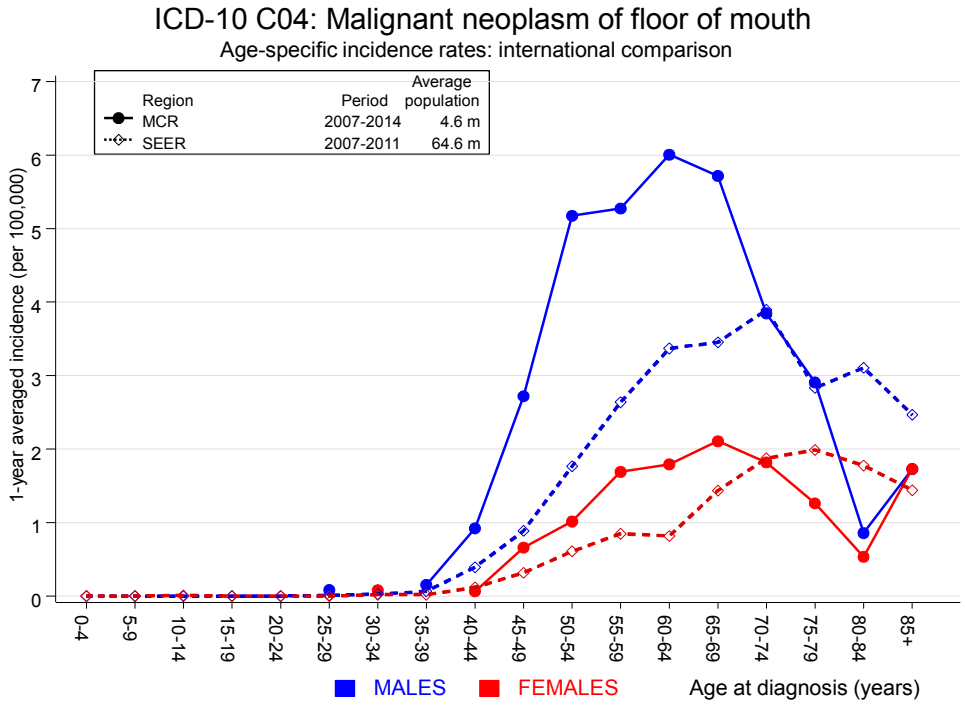


Figure 6a. Age-specific incidence in MCR registry areas compared to SEER (Surveillance, Epidemiology, and End Results, USA).

Reference:

Surveillance, Epidemiology, and End Results (SEER) Program SEER*Stat Database: Incidence - SEER 18 Regs Research Data, released April 2014, based on the November 2013 submission. http://www.seer.cancer.gov.

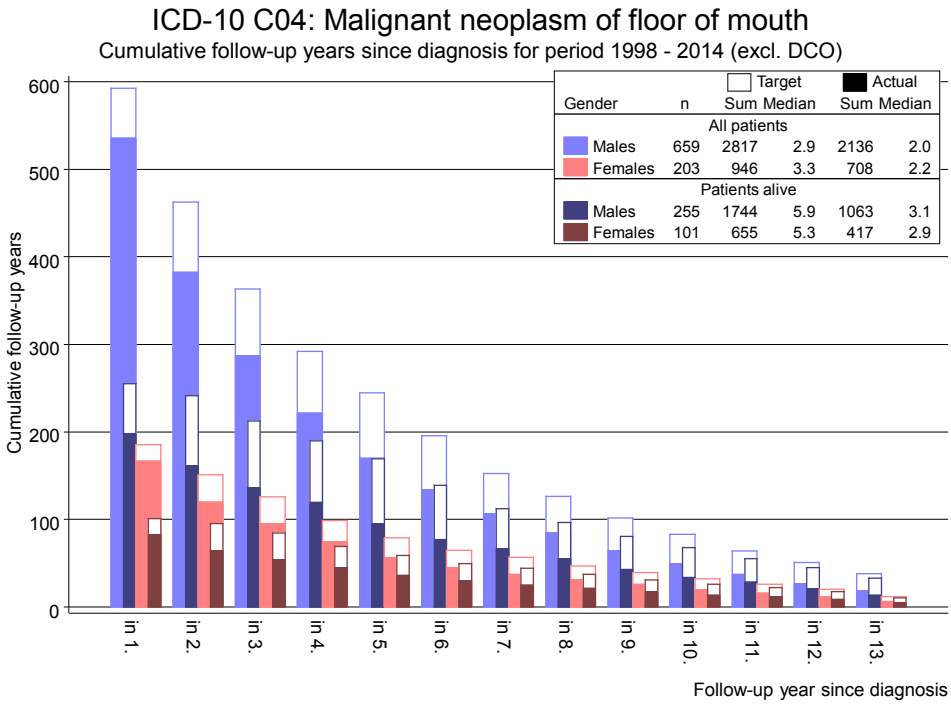


Figure 7. Cumulative follow-up years depending on time since diagnosis

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

Table 8a

Standardized incidence ratio (SIR, with 95% confidence limits), excess absolute risk (EAR) and DCO rate of second primaries for period 1998-2014
MALES

Diagnosis		Observed n	Expected n	SIR	LCL 95%	UCL 95%		EAR	DCO %
C03-C06	Oral cavity	5	0.3	15.6	5.1	36.4	#	21.8	
C09-C10	Oropharynx	23	0.4	55.5	35.2	83.3	#	105.4	4.3
C12-C13	Hypopharynx	15	0.2	67.1	37.6	110.7	#	69.0	6.7
C15	Oesophagus	19	0.5	37.0	22.3	57.8	#	86.3	5.3
C18	Colon	8	1.9	4.1	1.8	8.2	#	28.3	
C19-C20	Rectum	4	1.4	2.9	0.8	7.5		12.3	
C22	Liver	7	0.6	11.0	4.4	22.7	#	29.7	
C25	Pancreas	3	0.8	4.0	0.8	11.6		10.5	
C32	Larynx	10	0.3	31.8	15.2	58.4	#	45.2	10.0
C33-C34	Lung	43	2.8	15.3	11.1	20.7	#	187.6	9.3
C43	Malign. melanoma	4	1.1	3.6	1.0	9.3		13.5	
C61	Prostate	7	6.6	1.1	0.4	2.2		2.0	
C64	Kidney	4	0.9	4.5	1.2	11.5	#	14.5	
C67	Bladder	2	0.8	2.5	0.3	9.0		5.6	
C76-C79	CUP	4	0.4	11.0	3.0	28.2	#	17.0	
Other primaries		8	1.5	5.4	2.3	10.7	#	30.5	
Not observed		0	2.8	0.0	0.0	1.3		-12.9	
All mult. primaries		166	23.2	7.1	6.1	8.3	#	666.4	4.8

Patients	669
Median age at second malignancy (years)	62.8
Person-years	2142
Mean observation time (years)	3.2
Median observation time (years)	1.9

The occurrence of second malignancy is statistically significant.

Observed second primaries with count 1 are pooled in category “Other primaries”

Table 8b

Standardized incidence ratio (SIR, with 95% confidence limits), excess absolute risk (EAR) and DCO rate of second primaries for period 1998–2014
FEMALES

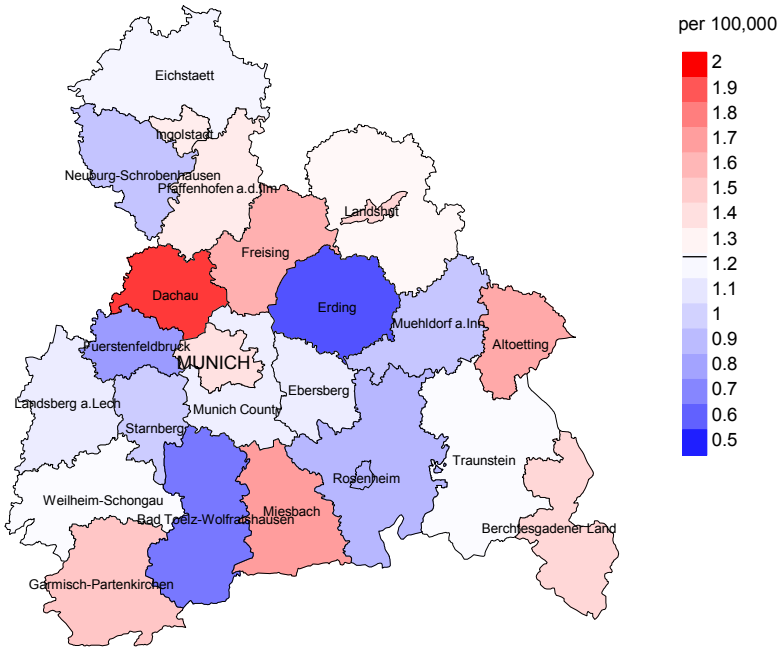
Diagnosis	Observed n	Expected n	SIR	LCL 95%	UCL 95%		EAR	DCO %
C09–C10 Oropharynx	8	0.0	208.7	90.1	411.2	#	111.4	
C12–C13 Hypopharynx	3	0.0	285.5	58.9	834.4	#	41.8	66.7
C15 Oesophagus	5	0.0	102.5	33.3	239.3	#	69.3	20.0
C22 Liver	2	0.1	24.9	3.0	89.9	#	26.9	
C33–C34 Lung	13	0.6	22.5	12.0	38.5	#	173.8	15.4
C50 Breast	2	2.5	0.8	0.1	2.9		-6.5	
Other primaries	6	1.6	3.8	1.4	8.3	#	61.9	16.7
Not observed	0	2.6	0.0	0.0	1.4		-37.1	
All mult. primaries	39	7.4	5.2	3.7	7.2	#	441.6	15.4

Patients	208
Median age at second malignancy (years)	65.2
Person-years	715
Mean observation time (years)	3.4
Median observation time (years)	2.1

The occurrence of second malignancy is statistically significant.

Observed second primaries with count 1 are pooled in category “Other primaries”

Average incidence (world standard population) 2007 - 2014: Males



Average incidence (world standard population) 2007 - 2014: Females

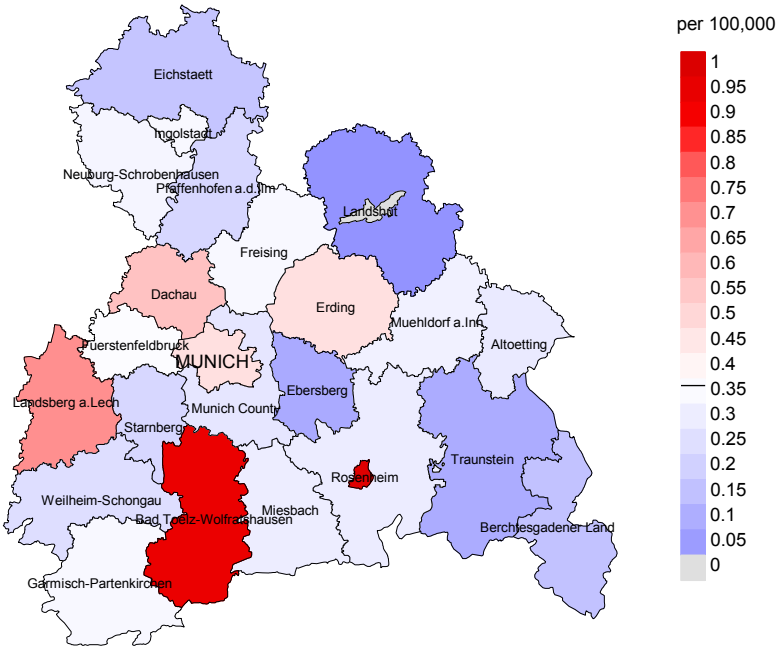
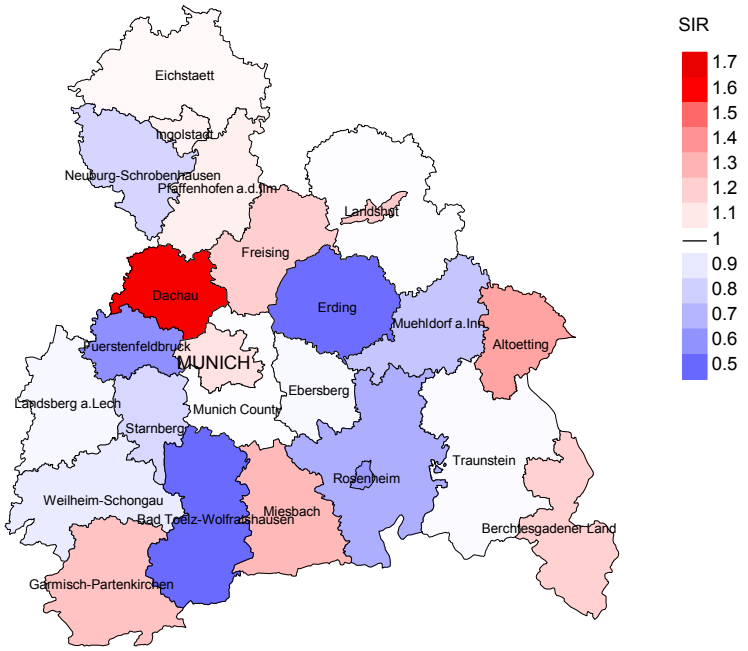


Figure 9a. Map of cancer incidence (world standard population, incl. DCO cases) by county averaged for period 2007 to 2014. According to their individual incidence rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (males 1.2/100,000 WS N=356, females 0.4/100,000 WS N=126).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 65,347 female residents (averaged) in the period from 2007 to 2014 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 0.6/100,000.

Standardized incidence ratio (SIR) 2007 - 2014: Males



Standardized incidence ratio (SIR) 2007 - 2014: Females

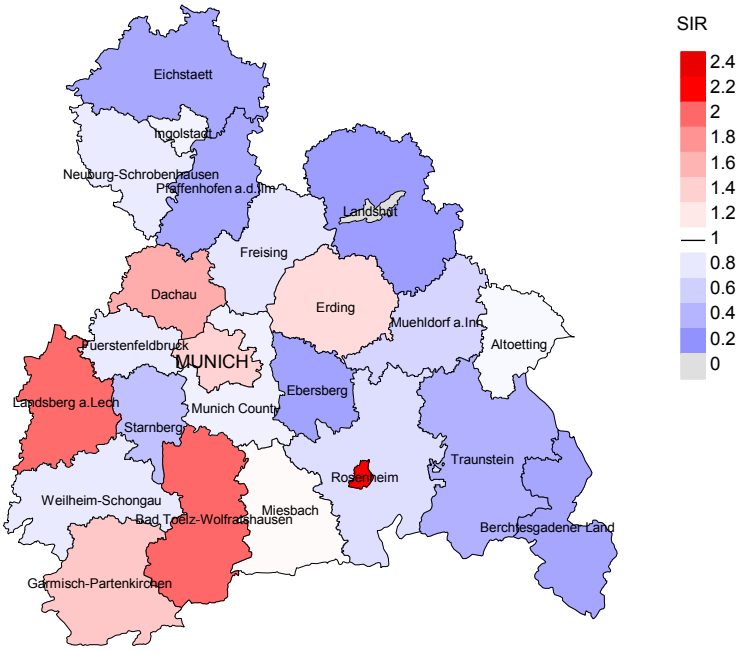


Figure 9b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2014. According to their individual SIR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (males N=356, females N=126).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 64,924 female residents (averaged) in the period from 2007 to 2014 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 0.29. Though, the value of this parameter may vary with an underlying probability of 99% between 0.00 and 2.16, 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 4.64 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	42	92.9	4.8	35	83.3	85.7
2000	40	100.0	2.5	28	70.0	92.9
2001	47	93.6	6.4	35	74.5	97.1
2002	52	100.0	3.8	38	73.1	97.4
2003	63	96.8	7.9	44	69.8	97.7
2004	56	98.2	5.4	40	71.4	97.5
2005	47	97.9	6.4	31	66.0	100.0
2006	60	96.7	1.7	41	68.3	100.0
2007	65	86.2	7.7	46	70.8	100.0
2008	63	73.0	4.8	38	60.3	94.7
2009	78	82.1	3.8	44	56.4	100.0
2010	88	75.0	6.8	45	51.1	100.0
2011	45	68.9	6.7	20	44.4	95.0
2012	66	77.3	7.6	28	42.4	92.9
2013	62	100.0	8.1	20	32.3	95.0
2014	15	100.0	40.0	8	53.3	100.0
1998-2014	922	88.8	6.4	570	61.8	96.8

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 4.64 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	42	24	87.5	5	11.9
2000	40	25	92.0	5	12.5
2001	47	35	88.6	8	17.0
2002	52	49	98.0	6	11.5
2003	63	57	96.5	11	17.5
2004	56	44	93.2	12	21.4
2005	47	38	100.0	4	8.5
2006	60	39	100.0	2	3.3
2007	65	46	97.8	10	15.4
2008	63	52	98.1	9	14.3
2009	78	67	98.5	12	15.4
2010	88	63	100.0	11	12.5
2011	45	56	98.2	6	13.3
2012	66	66	100.0	9	13.6
2013	62	55	98.2	11	17.7
2014	15	40	97.5	8	53.3
1998-2014	922	783	97.2	138	15.0

Table 10c

Annual cohorts of deaths, proportion of cancer-related and non-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 4.64 m as of 2007, respectively)

Year of death	Deaths n	Prop. cancer-related %	Prop. non-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	72.7	27.3	92.7
2005	38	86.8	13.2	92.1
2006	39	79.5	20.5	87.2
2007	46	73.9	26.1	88.9
2008	52	76.9	23.1	92.2
2009	67	83.6	16.4	90.9
2010	63	74.6	25.4	92.1
2011	56	73.2	26.8	85.5
2012	66	80.3	19.7	92.4
2013	55	76.4	23.6	94.4
2014	40	70.0	30.0	82.1
1998-2014	783	77.8	22.2	90.9

Table 11a

Medians 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 (non-cancer-related) Years	Age at death (according to death certificate) Years
1998	24	59.6	58.1	75.5	58.1
1999	18	54.7	57.5	50.3	53.1
2000	19	61.2	60.5	62.4	61.2
2001	29	60.5	60.5	53.5	61.0
2002	37	61.4	61.3	66.1	61.3
2003	48	63.2	63.0	68.4	64.9
2004	35	63.5	62.9	64.9	63.7
2005	30	69.1	67.7	79.6	69.1
2006	31	63.9	63.1	67.2	63.2
2007	38	62.8	60.0	66.0	62.3
2008	42	64.6	64.9	61.4	64.4
2009	55	66.6	63.9	74.1	63.9
2010	51	64.4	63.5	68.7	64.4
2011	44	63.0	61.3	67.1	62.0
2012	51	64.9	62.9	65.6	64.9
2013	40	66.3	63.8	72.4	65.3
2014	27	66.1	65.9	71.5	66.0
1998-2014	619	63.6	62.8	67.2	63.2

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

Medians 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 (non-cancer-related) Years	Age at death (according to death certificate) Years
1998	3	56.0	57.6	55.0	55.8
1999	6	81.3	70.6	91.9	70.6
2000	6	63.3	63.3	70.3	63.3
2001	6	68.3	73.9	62.8	73.9
2002	12	62.5	62.5		62.5
2003	9	69.8	70.4	59.5	70.4
2004	9	72.3	74.3	69.1	70.7
2005	8	62.8	62.1	85.1	62.1
2006	8	65.3	66.6	64.9	65.7
2007	8	64.4	64.1	64.8	64.4
2008	10	64.6	66.1	63.0	67.9
2009	12	69.0	67.9	70.5	67.9
2010	12	71.9	63.9	86.1	68.8
2011	12	73.1	73.1	69.4	71.9
2012	15	72.0	70.8	87.4	72.0
2013	15	71.6	71.3	71.6	71.6
2014	13	76.5	74.6	77.1	78.0
1998-2014	164	69.0	69.0	68.9	68.9

By 2010, life expectancy at birth was 77.5 years for boys and 82.6 years for girls.

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	0.45	0.7	0.43	1.0	0.43	1.1	0.45
2000	12	1.1	0.34	0.7	0.32	0.9	0.34	1.1	0.37
2001	23	2.0	0.66	1.3	0.66	1.8	0.65	2.0	0.66
2002	31	1.7	0.82	1.1	0.79	1.5	0.83	1.6	0.83
2003	39	2.1	0.83	1.2	0.75	1.7	0.77	2.1	0.88
2004	26	1.4	0.55	0.9	0.55	1.2	0.53	1.3	0.53
2005	26	1.4	0.70	0.7	0.62	1.1	0.66	1.4	0.73
2006	26	1.4	0.52	0.8	0.48	1.1	0.49	1.3	0.51
2007	29	1.3	0.57	0.8	0.54	1.1	0.57	1.3	0.58
2008	33	1.5	0.70	0.9	0.68	1.2	0.68	1.4	0.71
2009	45	2.0	0.74	1.2	0.69	1.7	0.70	1.9	0.75
2010	38	1.7	0.56	1.1	0.53	1.4	0.54	1.5	0.55
2011	31	1.4	1.11	0.8	1.15	1.1	1.14	1.3	1.12
2012	39	1.7	0.91	1.0	0.81	1.4	0.87	1.6	0.95
2013	30	1.3	0.61	0.8	0.59	1.1	0.59	1.2	0.60
2014	23	1.0	2.56	0.6	2.28	0.8	2.29	0.9	2.50
1998-2014	485	1.5	0.69	0.9	0.65	1.3	0.66	1.4	0.69

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	0.67	0.1	0.54	0.2	0.61	0.3	0.69
2005	7	0.4	0.70	0.2	0.79	0.3	0.75	0.3	0.70
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	0.44	0.1	0.39	0.2	0.39	0.2	0.35
2009	11	0.5	0.65	0.2	0.51	0.3	0.53	0.3	0.53
2010	9	0.4	0.45	0.2	0.39	0.3	0.43	0.3	0.49
2011	10	0.4	0.59	0.2	0.45	0.2	0.46	0.3	0.49
2012	14	0.6	0.61	0.3	0.50	0.4	0.53	0.5	0.58
2013	12	0.5	0.92	0.2	0.87	0.3	0.83	0.4	0.91
2014	5	0.2	0.83	0.1	0.90	0.1	0.89	0.2	0.80
1998-2014	124	0.4	0.57	0.2	0.49	0.3	0.51	0.3	0.53

Table 13

Age distribution of age at death (cancer-related) for period 2007-2014
(**incl. multiple primaries**)

Age at death Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
40-44	8	2.3	2.3	7	2.6	2.6	1	1.4	1.4
45-49	16	4.7	7.0	15	5.6	8.2	1	1.4	2.7
50-54	35	10.2	17.3	31	11.5	19.7	4	5.5	8.2
55-59	54	15.8	33.0	47	17.5	37.2	7	9.6	17.8
60-64	59	17.3	50.3	48	17.8	55.0	11	15.1	32.9
65-69	70	20.5	70.8	56	20.8	75.8	14	19.2	52.1
70-74	47	13.7	84.5	34	12.6	88.5	13	17.8	69.9
75-79	28	8.2	92.7	22	8.2	96.7	6	8.2	78.1
80-84	10	2.9	95.6	6	2.2	98.9	4	5.5	83.6
85+	15	4.4	100.0	3	1.1	100.0	12	16.4	100.0
All ages	342	100.0		269	100.0		73	100.0	

Included in the statistics are 42.1% multiple primaries in males and 29.4% in females.

Table 14

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2014
(**incl. multiple primaries**)

Age at death Years	Males n	Females n	Males Age-spec. mortal.	Males MI-index	Females Age-spec. mortal.	Females 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			0.0		0.0			
40-44	7	1	0.4	0.47	0.1	1.00	1.5	0.2
45-49	15	1	0.9	0.35	0.1	0.10	1.5	0.1
50-54	31	4	2.4	0.46	0.3	0.31	1.7	0.2
55-59	47	7	4.4	0.84	0.6	0.37	1.5	0.3
60-64	48	11	4.9	0.81	1.0	0.58	1.0	0.3
65-69	56	14	5.8	1.02	1.3	0.64	0.8	0.3
70-74	34	13	3.7	0.97	1.2	0.68	0.4	0.2
75-79	22	6	4.0	1.38	0.8	0.67	0.3	0.1
80-84	6	4	1.7	2.00	0.7	1.33	0.1	0.1
85+	3	12	1.3	0.75	2.1	1.20	0.0	0.1
All ages	269	73					0.5	0.2
Mortality								
Raw			1.5	0.76	0.4	0.58		
WS			0.9	0.71	0.2	0.49		
ES			1.2	0.73	0.3	0.51		
BRD-S			1.4	0.76	0.3	0.53		
PYLL-70								
per 100,000			13.5		2.1			
ES			11.8		1.7			
AYLL-70			10.6		8.6			

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

Table 15a

Multiple primaries in deaths in period 1998–2014
MALES

Diagnosis		Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C03–C06	Oral cavity	9	2.8					9	100.0
C09–C10	Oropharynx	40	12.6	16	40.0	9	22.5	15	37.5
C12–C13	Hypopharynx	26	8.2	10	38.5	2	7.7	14	53.8
C15	Oesophagus	30	9.5	4	13.3	7	23.3	19	63.3
C16	Stomach	4	1.3	1	25.0			3	75.0
C18	Colon	11	3.5	3	27.3	1	9.1	7	63.6
C19–C20	Rectum	9	2.8					9	100.0
C22	Liver	10	3.2	2	20.0	1	10.0	7	70.0
C32	Larynx	17	5.4	6	35.3	3	17.6	8	47.1
C33–C34	Lung	78	24.6	6	7.7	9	11.5	63	80.8
C43	Malign. melanoma	5	1.6	2	40.0	1	20.0	2	40.0
C44	Skin others	18	5.7	7	38.9			11	61.1
C61	Prostate	13	4.1	7	53.8	2	15.4	4	30.8
C64	Kidney	7	2.2	1	14.3			6	85.7
C67	Bladder	10	3.2	7	70.0			3	30.0
C76–C79	CUP	8	2.5	4	50.0			4	50.0
C82–C85	NHL	4	1.3	1	25.0	1	25.0	2	50.0
Other primaries		18	5.7	8	44.4			10	55.6
All mult. primaries		317	100.0	85	26.8	36	11.4	196	61.8

Multiple primaries with number of cases 1 to 3 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 1998-2014
FEMALES

Diagnosis		Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C03-C06	Oral cavity	3	4.1					3	100.0
C09-C10	Oropharynx	11	14.9	2	18.2	3	27.3	6	54.5
C12-C13	Hypopharynx	2	2.7					2	100.0
C15	Oesophagus	5	6.8					5	100.0
C16	Stomach	2	2.7					2	100.0
C18	Colon	4	5.4	4	100.0				
C21	Anus/canal	2	2.7					2	100.0
C22	Liver	2	2.7					2	100.0
C23-C24	Bile	1	1.4					1	100.0
C25	Pancreas	1	1.4					1	100.0
C30-C31	Sinuses	2	2.7					2	100.0
C32	Larynx	2	2.7	2	100.0				
C33-C34	Lung	17	23.0					17	100.0
C43	Malign. melanoma	1	1.4					1	100.0
C44	Skin others	3	4.1	1	33.3			2	66.7
C50	Breast	4	5.4	3	75.0			1	25.0
C51	Vulva	1	1.4	1	100.0				
C53	Cervix uteri	5	6.8	5	100.0				
C56	Ovary	1	1.4					1	100.0
C67	Bladder	1	1.4	1	100.0				
C70-C72	CNS cancer	1	1.4	1	100.0				
C73	Thyroid	1	1.4	1	100.0				
C82-C85	NHL	2	2.7	1	50.0	1	50.0		
All mult. primaries		74	100.0	22	29.7	4	5.4	48	64.9

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 16

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2014
(**First primaries only** *)

Age at death Years	Males n	Females n	Males Age-spec. mortal.	Males MI-index	Females Age-spec. mortal.	Females 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			0.0		0.0			
40-44	6	1	0.4	0.46	0.1	1.00	1.4	0.2
45-49	12	1	0.8	0.31	0.1	0.13	1.3	0.1
50-54	25	3	1.9	0.48	0.2	0.25	1.6	0.2
55-59	38	7	3.6	0.95	0.6	0.44	1.5	0.3
60-64	35	9	3.6	0.78	0.8	0.53	0.9	0.3
65-69	45	12	4.7	1.13	1.1	0.80	0.8	0.3
70-74	26	10	2.9	1.00	1.0	0.67	0.4	0.2
75-79	16	6	2.9	1.60	0.8	0.86	0.3	0.1
80-84	4	4	1.1	4.00	0.7	1.33	0.1	0.1
85+	3	10	1.3	1.00	1.7	1.25	0.1	0.1
All ages	210	63					0.5	0.2
Mortality								
Raw			1.2	0.77	0.3	0.61		
WS			0.7	0.72	0.2	0.51		
ES			1.0	0.75	0.2	0.53		
BRD-S			1.1	0.78	0.3	0.56		
PYLL-70								
per 100,000			10.7		1.8			
ES			9.4		1.5			
AYLL-70			10.7		8.7			

* See corresponding tables with multiple primaries.

Table 17

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2014
(**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			0.0		0.0			
40-44	6	1	0.4	0.60	0.1	1.00	1.5	0.2
45-49	9	1	0.6	0.24	0.1	0.13	1.0	0.1
50-54	20	2	1.5	0.43	0.2	0.20	1.4	0.2
55-59	24	5	2.3	0.69	0.4	0.36	1.0	0.3
60-64	16	6	1.6	0.40	0.6	0.35	0.5	0.2
65-69	21	5	2.2	0.58	0.5	0.38	0.4	0.1
70-74	17	6	1.9	0.77	0.6	0.46	0.3	0.1
75-79	13	4	2.4	1.30	0.6	0.67	0.3	0.1
80-84	2	3	0.6	2.00	0.5	1.00	0.0	0.1
85+	3	10	1.3	1.50	1.7	1.25	0.1	0.2
All ages	131	43					0.4	0.1
Mortality								
Raw			0.7	0.54	0.2	0.46		
WS			0.4	0.50	0.1	0.36		
ES			0.6	0.52	0.1	0.38		
BRD-S			0.7	0.54	0.2	0.41		
PYLL-70								
per 100,000			7.4		1.3			
ES			6.5		1.1			
AYLL-70			12.4		10.3			

* See corresponding tables with multiple primaries.

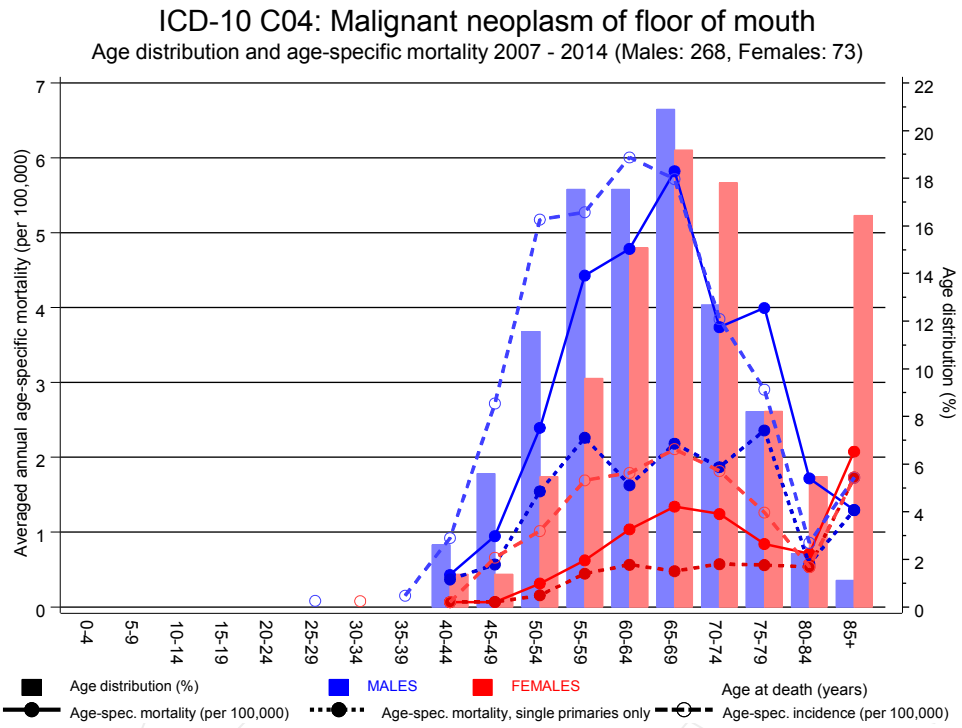
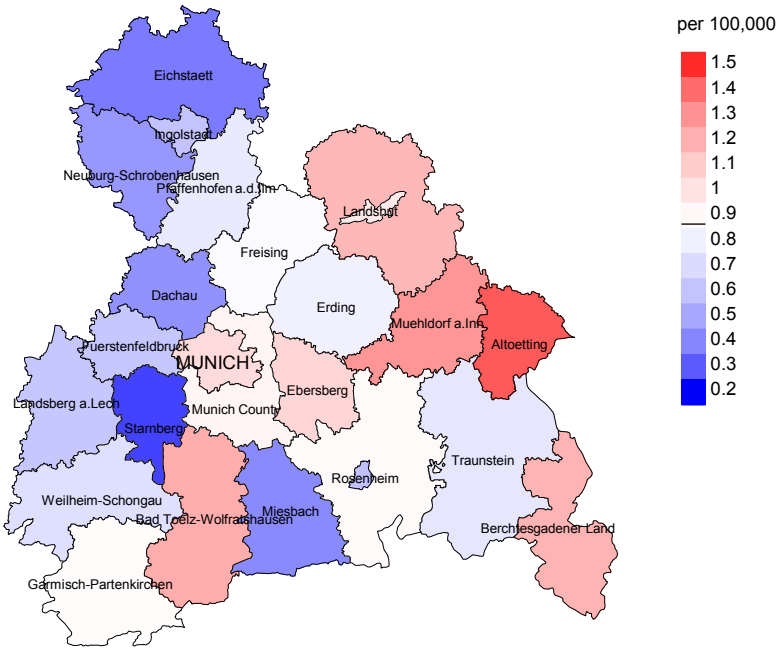


Figure 18. Distribution of age at death (bars) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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

Average mortality (world standard population) 2007 - 2014: Males



Average mortality (world standard population) 2007 - 2014: Females

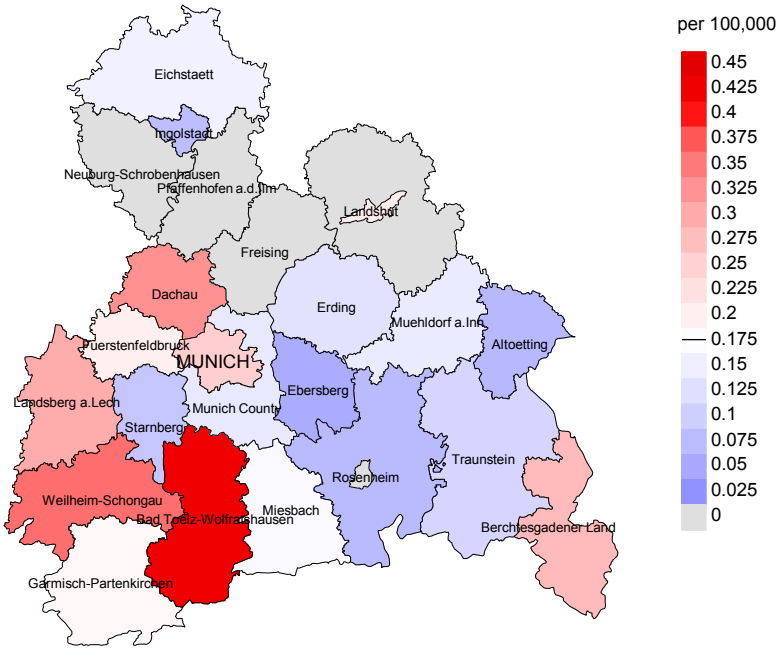
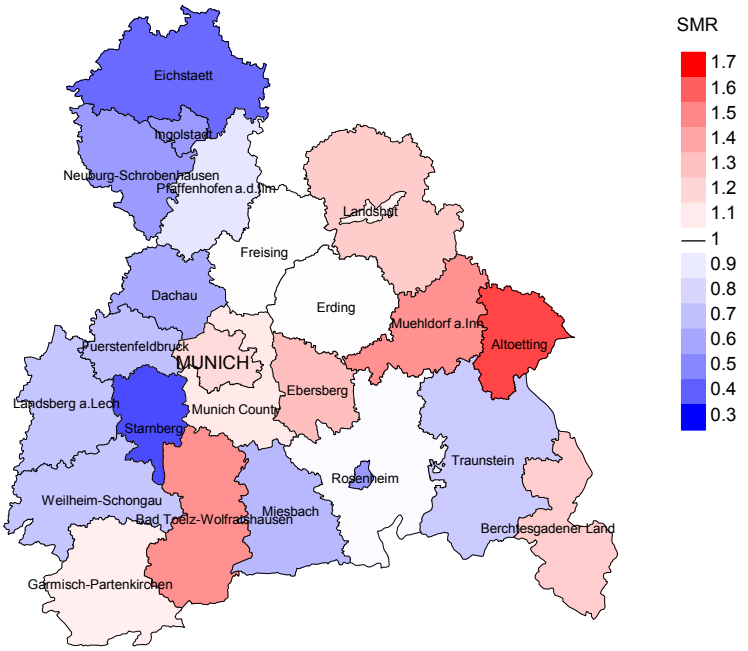


Figure 19a. Map of cancer mortality (world standard population) by county averaged for period 2007 to 2014. According to their individual mortality rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (males 0.9/100,000 WS N=266, females 0.2/100,000 WS N=73).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 65,347 female residents (averaged) in the period from 2007 to 2014 a total of 1 women died from floor of mouth cancer. Therefore, the mean mortality 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 0.4/100,000.

Standardized mortality ratio (SMR) 2007 - 2014: Males



Standardized mortality ratio (SMR) 2007 - 2014: Females

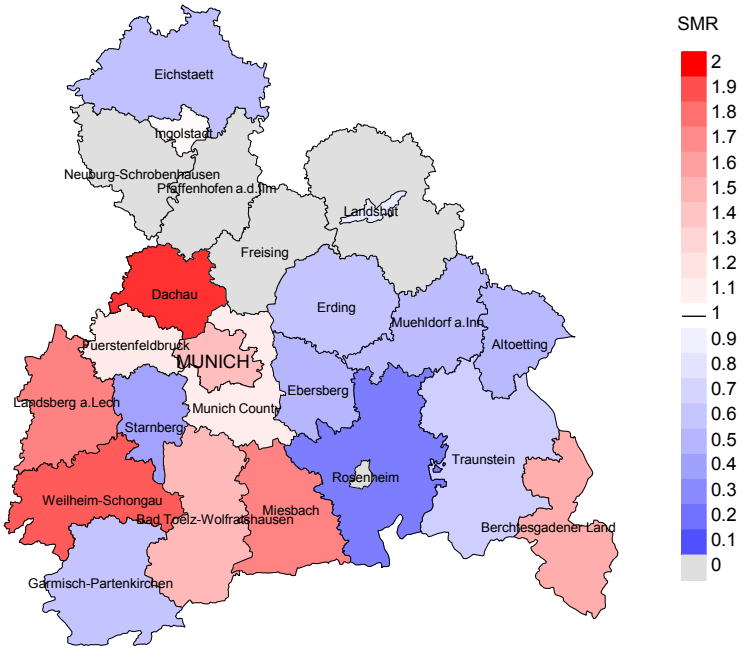


Figure 19b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2014. According to their individual SMR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (males N=266, females N=73).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 64,924 female residents (averaged) in the period from 2007 to 2014 a total of 1 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 0.51. Though, the value of this parameter may vary with an underlying probability of 99% between 0.00 and 3.82, 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, where applicable. 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 cancer-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

FRG	Federal Republic of Germany
GEKID	Association of Population-based Cancer Registries in Germany (Gesellschaft der epidemiologischen Krebsregister in Deutschland e.V.)
MCR	Munich Cancer Registry (Tumorregister München)
SEER	Surveillance, Epidemiology, and End Results (USA)
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)
LCL	Lower confidence limit
MI-index	Ratio between mortality and incidence
PYLL-70	Potential years of life lost prior to age 70 given a person dies before that age
SIR	Standardized incidence ratio
SMR	Standardized mortality ratio
UCL	Upper confidence limit
WS	World standard population

Recommended Citation

Munich Cancer Registry. ICD-10 C04: Floor of mouth cancer - Incidence and Mortality [Internet]. 2016 [updated 2016 Apr 13; cited 2016 Jun 1]. Available from: http://www.tumorregister-muenchen.de/en/facts/base/bC04__E-ICD-10-C04-Floor-of-mouth-cancer-incidence-and-mortality.pdf

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