Munich Cancer Registry

ICD-10 C05: Palate cancer

Incidence and Mortality

Year of diagnosis	1998-2014
Patients	510
Diseases	511
Creation date	04/13/2016
Export date	12/23/2015
Population	4.64 m

BERLIN

GERMANY

BAVARIA

MUNICH

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/bC05__E-ICD-10-C05-Palate-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
C05.-	Malignant neoplasm of palate
C05.0	Hard palate
C05.1	Soft palate
C05.2	Uvula
C05.8	Overlapping lesion of palate
C05.9	Palate, 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	24			29.2	79.2	100.0
1999	26			42.3	80.8	96.2
2000	25			28.0	72.0	100.0
2001	24	1	4.2	37.5	79.2	100.0
2002	28			42.9	71.4	96.4 #
2003	36			41.7	69.4	100.0
2004	38	1	2.6	23.7	68.4	94.7
2005	23	2	8.7	30.4	78.3	95.7
2006	14			50.0	57.1	92.9
2007	36			41.7	66.7	91.7 #
2008	45			42.2	42.2	77.8
2009	39			33.3	51.3	89.7
2010	52	1	1.9	36.5	46.2	67.3
2011	36	1	2.8	30.6	33.3	72.2
2012	33	1	3.0	33.3	24.2	81.8
2013	29			41.4	20.7	100.0
2014	3	1	33.3	33.3	66.7	100.0 ##
1998-2014	511	8	1.6	36.2	56.6	89.0

\#   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	24	16	8	66.7
1999	26	17	9	65.4
2000	25	22	3	88.0
2001	24	14	10	58.3
2002	28	22	6	78.6
2003	36	27	9	75.0
2004	38	24	14	63.2
2005	23	14	9	60.9
2006	14	9	5	64.3
2007	36	29	7	80.6
2008	45	38	7	84.4
2009	39	24	15	61.5
2010	52	36	16	69.2
2011	36	27	9	75.0
2012	33	23	10	69.7
2013	29	16	13	55.2
2014	3	3		100.0
1998-2014	511	361	150	70.6

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	16	8	1.4	0.7	1.0	0.4	1.3	0.6	1.5	0.6
1999	17	9	1.5	0.8	1.0	0.5	1.4	0.7	1.5	0.7
2000	22	3	1.9	0.2	1.3	0.1	1.8	0.1	1.9	0.2
2001	14	10	1.2	0.8	0.8	0.5	1.1	0.7	1.2	0.8
2002	22	6	1.2	0.3	0.8	0.2	1.0	0.3	1.1	0.3
2003	27	9	1.4	0.5	0.9	0.3	1.3	0.4	1.4	0.4
2004	24	14	1.3	0.7	0.9	0.4	1.2	0.5	1.3	0.6
2005	14	9	0.7	0.5	0.4	0.3	0.6	0.4	0.7	0.4
2006	9	5	0.5	0.2	0.3	0.2	0.4	0.2	0.4	0.2
2007	29	7	1.3	0.3	0.8	0.2	1.1	0.2	1.3	0.3
2008	38	7	1.7	0.3	1.1	0.2	1.6	0.3	1.7	0.3
2009	24	15	1.1	0.6	0.6	0.4	0.9	0.5	1.0	0.6
2010	36	16	1.6	0.7	1.0	0.4	1.3	0.5	1.5	0.6
2011	27	9	1.2	0.4	0.8	0.2	1.0	0.3	1.1	0.3
2012	23	10	1.0	0.4	0.6	0.3	0.9	0.4	1.0	0.4
2013	16	13	0.7	0.6	0.4	0.3	0.6	0.4	0.7	0.4
2014	3		0.1		0.1		0.1		0.1	
1998-2014	361	150	1.1	0.4	0.7	0.3	1.0	0.4	1.1	0.4

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	24	58.3	9.8	40.9	82.2	46.4	52.5	57.5	62.4	66.9
1999	26	54.7	10.2	30.7	83.3	40.8	49.1	55.6	59.1	66.7
2000	25	60.3	10.6	43.5	85.1	48.1	54.0	57.3	67.2	78.7
2001	24	60.0	8.5	46.3	75.6	50.1	53.3	59.9	66.5	71.4
2002	28	57.7	10.5	35.8	82.6	42.7	50.5	59.0	62.5	72.1
2003	36	58.9	12.2	32.6	82.1	44.5	51.4	58.7	66.3	76.8
2004	38	60.2	14.6	26.4	97.9	45.5	51.2	60.0	66.0	82.3
2005	23	61.5	11.7	39.8	83.4	47.8	51.4	61.2	68.7	76.0
2006	14	53.9	12.2	22.6	69.2	43.5	47.9	54.7	62.8	69.0
2007	36	62.1	10.3	31.7	86.3	50.2	57.9	62.1	68.3	75.3
2008	45	59.4	9.0	43.5	87.7	49.3	53.6	57.9	64.2	71.6
2009	39	60.9	11.4	40.7	89.3	46.2	51.8	58.7	69.7	72.7
2010	52	62.8	11.3	35.9	91.6	50.2	54.7	62.6	68.5	75.1
2011	36	60.3	12.5	32.8	87.2	43.5	55.2	58.8	69.4	73.6
2012	33	61.5	11.7	21.6	78.8	50.9	57.4	63.7	66.8	76.0
2013	29	63.4	11.6	35.7	83.9	44.7	57.3	65.6	70.5	77.4
2014	3	67.6	11.8	56.7	80.1	56.7	56.7	66.0	80.1	80.1
1998-2014	511	60.2	11.3	21.6	97.9	47.0	53.2	59.7	67.2	75.1

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	16	56.1	8.4	45.5	81.2	46.4	51.0	55.4	59.9	62.3
1999	17	56.8	9.8	40.8	83.3	43.9	51.0	57.2	60.3	68.2
2000	22	58.5	9.0	43.5	79.7	48.1	53.2	56.6	66.6	69.5
2001	14	57.3	7.1	46.3	75.6	48.5	53.5	57.2	60.6	62.1
2002	22	59.0	8.5	42.4	74.5	49.0	53.2	60.3	62.6	71.0
2003	27	59.7	9.8	44.5	82.1	46.4	51.7	60.1	65.9	72.4
2004	24	58.0	12.1	29.7	88.7	45.5	50.4	57.9	63.1	72.6
2005	14	60.7	11.0	39.8	83.1	47.8	53.4	61.0	68.1	70.0
2006	9	57.2	7.9	46.9	69.2	46.9	52.1	56.6	62.8	69.2
2007	29	61.7	11.0	31.7	86.3	46.5	57.9	60.5	66.5	75.5
2008	38	58.7	9.0	43.5	87.7	46.9	53.4	57.6	64.2	71.6
2009	24	60.6	10.4	40.7	82.3	47.6	51.5	60.4	69.7	70.8
2010	36	63.1	9.8	35.9	87.2	50.7	56.6	64.0	68.5	75.1
2011	27	58.1	10.1	32.8	73.6	43.5	52.4	57.9	67.3	72.3
2012	23	61.3	13.2	21.6	78.8	50.9	55.3	63.7	67.5	77.4
2013	16	61.0	11.4	35.7	82.0	49.2	53.3	61.6	68.1	75.7
2014	3	67.6	11.8	56.7	80.1	56.7	56.7	66.0	80.1	80.1
1998-2014	361	59.6	10.1	21.6	88.7	47.6	53.2	59.1	65.9	72.3

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	8	62.6	11.4	40.9	82.2	40.9	59.2	63.7	66.0	82.2
1999	9	50.7	10.3	30.7	66.7	30.7	48.5	52.0	56.1	66.7
2000	3	73.7	14.5	57.3	85.1	57.3	57.3	78.7	85.1	85.1
2001	10	63.7	9.2	50.1	75.5	50.9	53.2	66.5	70.7	73.5
2002	6	52.6	16.0	35.8	82.6	35.8	45.0	48.7	54.9	82.6
2003	9	56.7	18.2	32.6	81.2	32.6	47.2	53.2	74.8	81.2
2004	14	64.0	17.9	26.4	97.9	47.2	54.6	64.6	77.2	83.1
2005	9	62.8	13.1	44.5	83.4	44.5	50.3	61.2	73.9	83.4
2006	5	48.1	17.0	22.6	69.0	22.6	43.5	50.2	55.1	69.0
2007	7	63.8	7.2	51.0	71.4	51.0	60.3	62.4	70.7	71.4
2008	7	63.6	7.9	53.4	76.8	53.4	57.2	62.4	69.0	76.8
2009	15	61.5	13.1	41.9	89.3	43.1	54.8	58.7	70.0	79.6
2010	16	62.1	14.4	38.5	91.6	47.0	53.4	58.9	70.4	83.9
2011	9	67.2	16.6	34.7	87.2	34.7	56.8	66.6	78.8	87.2
2012	10	61.8	7.9	46.0	75.5	51.3	57.4	62.4	65.4	72.2
2013	13	66.2	11.6	41.3	83.9	44.7	65.5	67.6	70.8	77.4
1998–2014	150	61.6	13.7	22.6	97.9	44.6	53.2	61.6	70.0	80.5

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.%
20-24	1	0.4	0.4	1	0.5	0.5			0.0
25-29	0	0.0	0.4			0.5			0.0
30-34	3	1.1	1.5	2	1.0	1.5	1	1.3	1.3
35-39	4	1.5	2.9	3	1.5	3.1	1	1.3	2.6
40-44	9	3.3	6.2	5	2.6	5.6	4	5.2	7.8
45-49	18	6.6	12.8	14	7.1	12.8	4	5.2	13.0
50-54	32	11.7	24.5	26	13.3	26.0	6	7.8	20.8
55-59	59	21.6	46.2	44	22.4	48.5	15	19.5	40.3
60-64	44	16.1	62.3	34	17.3	65.8	10	13.0	53.2
65-69	47	17.2	79.5	32	16.3	82.1	15	19.5	72.7
70-74	26	9.5	89.0	17	8.7	90.8	9	11.7	84.4
75-79	16	5.9	94.9	11	5.6	96.4	5	6.5	90.9
80-84	7	2.6	97.4	4	2.0	98.5	3	3.9	94.8
85+	7	2.6	100.0	3	1.5	100.0	4	5.2	100.0
All ages	273	100.0		196	100.0		77	100.0	

Included in the statistics are 62.6% multiple primaries in males and 35.1% 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=3 %	Females DCO rate n=1 %	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	1		0.1	0.0			0.3	
25-29			0.0	0.0				
30-34	2	1	0.2	0.1			0.3	0.1
35-39	3	1	0.2	0.1			0.3	0.1
40-44	5	4	0.3	0.3			0.3	0.1
45-49	14	4	0.9	0.3			0.4	0.1
50-54	26	6	2.0	0.5			0.5	0.1
55-59	43	15	4.0	1.3			0.6	0.2
60-64	34	10	3.5	0.9			0.3	0.1
65-69	32	15	3.3	1.4			0.2	0.1
70-74	17	9	1.9	0.9			0.1	0.1
75-79	11	5	2.0	0.7	9.1		0.1	0.0
80-84	4	3	1.1	0.5	25.0		0.0	0.0
85+	3	4	1.3	0.7	33.3	25.0	0.0	0.0
All ages	195	77			1.5	1.3	0.2	0.1
Incidence								
Raw			1.1	0.4				
WS			0.7	0.2				
ES			0.9	0.3				
BRD-S			1.0	0.4				

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).
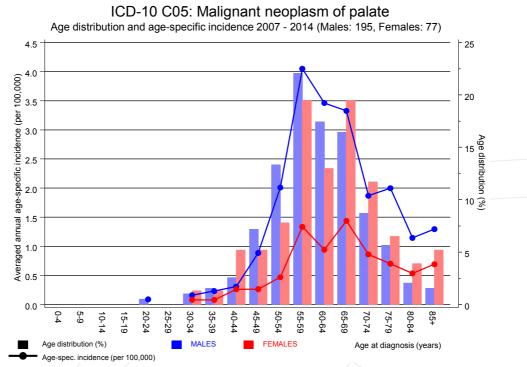
Figure 6. Age distribution and age-specific incidence

ICD-10 C05: Malignant neoplasm of palate
Age-specific incidence rates: international comparison

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.

ICD-10 C05: Malignant neoplasm of palate

Cumulative follow-up years since diagnosis for period 1998 - 2014 (excl. DCO)

Gender	n	Target Sum	Median	Actual Sum	Median
All patients					
Males	356	1529	3.0	1150	2.0
Females	146	715	3.1	543	2.2
Patients alive					
Males	146	960	5.6	581	3.2
Females	76	521	5.8	349	3.6
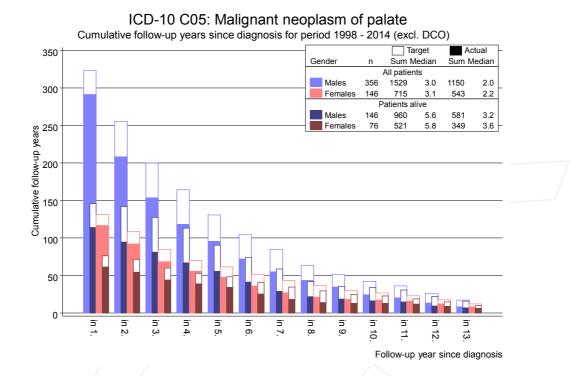
Figure 7. Cumulative follow-up years depending on time since diagnosis

The increase of the lost to follow-up rate can be interpreted as a consequence of a declining number of survivors over time.
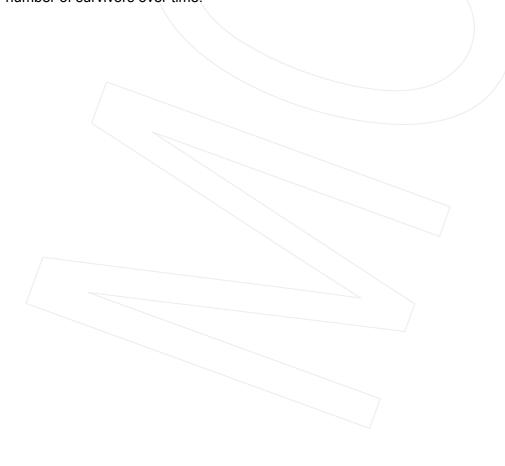
Table 8a

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	11	0.2	63.8	31.8	114.1	#	94.7	
C09-C10 Oropharynx	8	0.2	35.0	15.1	68.9	#	68.0	
C12-C13 Hypopharynx	8	0.1	64.6	27.9	127.2	#	68.9	
C15 Oesophagus	16	0.3	54.8	31.4	89.1	#	137.4	6.3
C16 Stomach	4	0.5	8.9	2.4	22.7	#	31.0	25.0
C18 Colon	7	1.1	6.4	2.6	13.2	#	51.7	
C19-C20 Rectum	2	0.8	2.6	0.3	9.4		10.8	
C22 Liver	3	0.4	8.3	1.7	24.3	#	23.1	33.3
C32 Larynx	5	0.2	28.2	9.2	65.8	#	42.2	20.0
C33-C34 Lung	16	1.6	10.1	5.8	16.3	#	126.0	12.5
C61 Prostate	3	3.8	0.8	0.2	2.3		-6.8	
C76-C79 CUP	2	0.2	9.8	1.2	35.4	#	15.7	
C82-C85 NHL	7	0.5	14.5	5.8	29.8	#	57.0	28.6
Other primaries	8	1.3	6.0	2.6	11.9	#	58.4	
Not observed	0	2.1	0.0	0.0	1.8		-18.4	
All mult. primaries	100	13.2	7.6	6.2	9.2	#	759.6	8.0

Patients	359
Median age at second malignancy (years)	61.5
Person-years	1143
Mean observation time (years)	3.2
Median observation time (years)	2.0

The occurrence of second malignancy is statistically significant.

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

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                              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
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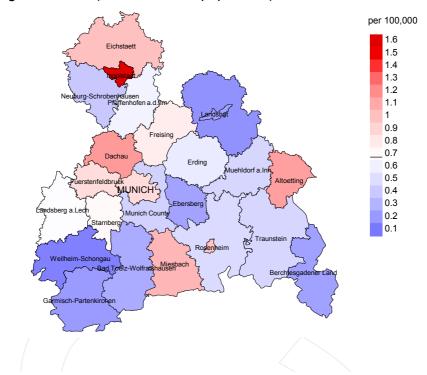
Diagnosis	Observed n	Expected n	SIR	LCL 95%	UCL 95%		EAR	DCO %
C15 Oesophagus	4	0.0	142.3	38.8	364.2	#	73.3	
C30-C31 Sinuses	2	0.0	329.0	39.8	1188	#	36.8	
C33-C34 Lung	3	0.4	8.5	1.8	24.9	#	48.8	
C50 Breast	4	1.6	2.5	0.7	6.4		44.1	
C73 Thyroid	2	0.1	18.0	2.2	64.9	#	34.8	
Other primaries	5	0.4	11.2	3.6	26.2	#	84.0	20.0
Not observed	0	2.3	0.0	0.0	1.6		-42.5	
All mult. primaries	20	4.9	4.1	2.5	6.4	#	279.4	5.0

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Patients                                      145
Median age at second malignancy (years)      64.0
Person-years                                  542
Mean observation time (years)                 3.7
Median observation time (years)               2.3
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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

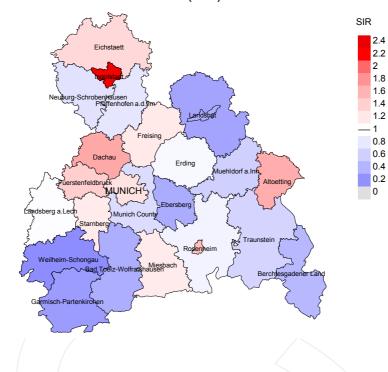Average incidence (world standard population) 2007 - 2014: Females
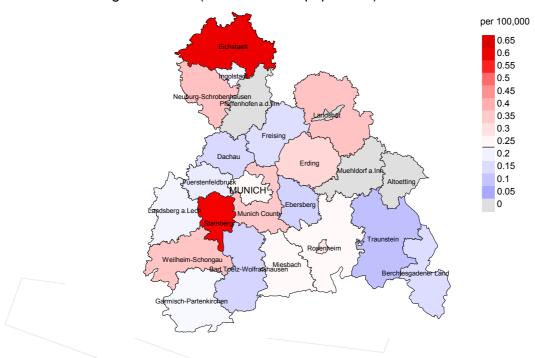
Figure 9a. Map of cancer incidence (world standard population, incl. DCO cases) by county averaged for period 2007 to 2014. According to their individual incidence rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (males 0.7/100,000 WS N=195, females 0.2/100,000 WS N=77).

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 palate 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 1.0/100,000.

Standardized incidence ratio (SIR) 2007 - 2014: Males

Standardized incidence ratio (SIR) 2007 - 2014: Females
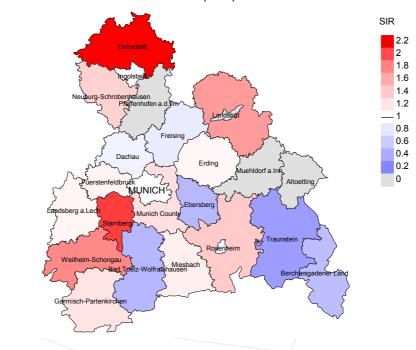

Figure 9b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2014. According to their individual SIR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (males N=195, females N=77).

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 palate cancer. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 0.47. Though, the value of this parameter may vary with an underlying probability of 99% between 0.00 and 3.52, 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	24	100.0		19	79.2	89.5
1999	26	96.2		21	80.8	90.5
2000	25	100.0		18	72.0	88.9
2001	24	100.0	4.2	19	79.2	94.7
2002	28	96.4		20	71.4	90.0
2003	36	100.0		25	69.4	96.0
2004	38	94.7	2.6	26	68.4	100.0
2005	23	95.7	8.7	18	78.3	100.0
2006	14	92.9		8	57.1	100.0
2007	36	91.7		24	66.7	95.8
2008	45	77.8		19	42.2	100.0
2009	39	89.7		20	51.3	100.0
2010	52	67.3	1.9	24	46.2	100.0
2011	36	72.2	2.8	12	33.3	100.0
2012	33	81.8	3.0	8	24.2	100.0
2013	29	100.0		6	20.7	100.0
2014	3	100.0	33.3	2	66.7	100.0
1998-2014	511	89.0	1.6	289	56.6	96.2

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	24	14	92.9	2	8.3
1999	26	12	91.7	2	7.7
2000	25	12	83.3		
2001	24	25	88.0	3	12.5
2002	28	20	100.0	4	14.3
2003	36	26	100.0	6	16.7
2004	38	28	89.3	7	18.4
2005	23	23	95.7	6	26.1
2006	14	29	96.6	2	14.3
2007	36	23	100.0	2	5.6
2008	45	15	100.0	6	13.3
2009	39	34	97.1	4	10.3
2010	52	28	100.0	5	9.6
2011	36	33	93.9	4	11.1
2012	33	22	100.0	3	9.1
2013	29	27	100.0	3	10.3
2014	3	17	100.0	2	66.7
1998–2014	511	388	96.1	61	11.9

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	14	78.6	21.4	92.3
1999	12	58.3	41.7	81.8
2000	12	66.7	33.3	90.0
2001	25	64.0	36.0	77.3
2002	20	85.0	15.0	100.0
2003	26	76.9	23.1	88.5
2004	28	67.9	32.1	88.0
2005	23	95.7	4.3	100.0
2006	29	72.4	27.6	89.3
2007	23	82.6	17.4	91.3
2008	15	93.3	6.7	100.0
2009	34	79.4	20.6	90.9
2010	28	78.6	21.4	82.1
2011	33	66.7	33.3	83.9
2012	22	54.5	45.5	68.2
2013	27	70.4	29.6	88.9
2014	17	70.6	29.4	82.4
1998-2014	388	74.2	25.8	87.7

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	10	57.9	52.9	59.3	55.0
1999	12	56.4	55.6	59.4	53.8
2000	10	69.3	69.6	69.0	70.4
2001	20	62.7	63.8	61.6	64.7
2002	13	62.3	63.0	61.6	62.3
2003	15	62.2	62.3	61.8	62.3
2004	21	63.8	61.2	65.1	63.8
2005	12	67.0	66.6	74.6	66.6
2006	21	63.1	63.5	59.7	63.5
2007	19	64.3	63.8	79.4	64.3
2008	10	59.9	59.9		59.9
2009	29	65.1	64.6	72.0	65.1
2010	23	61.7	61.7	68.9	61.0
2011	21	68.9	68.3	69.9	68.3
2012	17	69.8	69.3	71.5	68.8
2013	21	63.6	62.6	64.9	62.9
2014	15	63.8	63.6	63.8	62.5
1998–2014	289	63.8	63.7	64.5	63.8

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	4	64.1	64.1		64.1
1999					
2000	2	54.0	55.6	52.4	55.6
2001	5	68.2	68.2	68.7	68.2
2002	7	62.7	81.1	53.9	62.7
2003	11	60.2	54.6	82.4	60.2
2004	7	65.1	62.5	71.4	62.5
2005	11	65.0	65.0		65.0
2006	8	74.6	68.5	78.6	75.3
2007	4	69.5	69.5		69.5
2008	5	63.1	58.5	72.3	63.1
2009	5	69.9	67.2	87.0	69.9
2010	5	81.5	62.0	83.9	62.0
2011	12	61.0	60.6	68.4	60.6
2012	5	79.6	66.9	80.5	66.9
2013	6	75.8	68.2	76.1	75.5
2014	2	77.4	77.4		77.4
1998−2014	99	68.2	63.9	78.1	65.0

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	7	0.6	0.44	0.4	0.41	0.6	0.44	0.6	0.44
1999	7	0.6	0.41	0.4	0.41	0.6	0.42	0.7	0.45
2000	7	0.6	0.32	0.3	0.25	0.5	0.30	0.8	0.40
2001	13	1.1	0.93	0.7	0.94	1.1	0.97	1.1	0.96
2002	12	0.6	0.55	0.4	0.50	0.5	0.52	0.6	0.56
2003	12	0.6	0.44	0.4	0.41	0.5	0.43	0.6	0.46
2004	14	0.7	0.58	0.5	0.54	0.7	0.57	0.7	0.54
2005	11	0.6	0.79	0.3	0.70	0.4	0.71	0.5	0.75
2006	16	0.8	1.78	0.5	1.66	0.7	1.71	0.8	1.76
2007	15	0.7	0.52	0.4	0.52	0.6	0.50	0.7	0.51
2008	10	0.4	0.27	0.3	0.27	0.4	0.27	0.5	0.28
2009	23	1.0	0.96	0.6	0.95	0.8	0.95	1.0	0.99
2010	19	0.8	0.53	0.5	0.50	0.7	0.52	0.8	0.52
2011	13	0.6	0.48	0.3	0.40	0.4	0.43	0.5	0.50
2012	10	0.4	0.43	0.2	0.37	0.3	0.39	0.4	0.38
2013	16	0.7	1.00	0.4	0.97	0.6	0.94	0.6	0.96
2014	10	0.4	3.33	0.2	3.68	0.4	3.60	0.4	3.32
1998-2014	215	0.7	0.60	0.4	0.56	0.6	0.57	0.6	0.60

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	4	0.3	0.50	0.2	0.42	0.3	0.45	0.3	0.50
1999									
2000	1	0.1	0.33	0.0	0.58	0.1	0.51	0.1	0.39
2001	3	0.2	0.30	0.1	0.26	0.2	0.28	0.2	0.30
2002	5	0.3	0.83	0.1	0.45	0.1	0.54	0.2	0.67
2003	8	0.4	0.89	0.3	0.93	0.4	0.92	0.4	0.90
2004	5	0.3	0.36	0.1	0.32	0.2	0.35	0.2	0.36
2005	11	0.6	1.22	0.3	1.04	0.4	1.12	0.5	1.15
2006	5	0.2	1.00	0.1	0.47	0.1	0.59	0.2	0.74
2007	4	0.2	0.57	0.1	0.45	0.1	0.53	0.2	0.63
2008	4	0.2	0.57	0.1	0.63	0.2	0.63	0.2	0.64
2009	4	0.2	0.27	0.1	0.24	0.1	0.23	0.1	0.24
2010	3	0.1	0.19	0.1	0.17	0.1	0.16	0.1	0.17
2011	9	0.4	1.00	0.2	1.16	0.3	1.04	0.3	0.96
2012	2	0.1	0.20	0.0	0.17	0.1	0.16	0.1	0.17
2013	3	0.1	0.23	0.1	0.22	0.1	0.24	0.1	0.25
2014	2	0.1		0.0		0.0		0.1	
1998-2014	73	0.2	0.49	0.1	0.42	0.2	0.44	0.2	0.47

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	3	2.0	2.0	1	0.9	0.9	2	6.5	6.5
45-49	6	4.1	6.1	5	4.3	5.2	1	3.2	9.7
50-54	16	10.9	17.0	13	11.2	16.4	3	9.7	19.4
55-59	19	12.9	29.9	17	14.7	31.0	2	6.5	25.8
60-64	35	23.8	53.7	26	22.4	53.4	9	29.0	54.8
65-69	23	15.6	69.4	20	17.2	70.7	3	9.7	64.5
70-74	21	14.3	83.7	19	16.4	87.1	2	6.5	71.0
75-79	13	8.8	92.5	10	8.6	95.7	3	9.7	80.6
80-84	4	2.7	95.2	3	2.6	98.3	1	3.2	83.9
85+	7	4.8	100.0	2	1.7	100.0	5	16.1	100.0
All ages	147	100.0		116	100.0		31	100.0	

Included in the statistics are 62.6% multiple primaries in males and 35.1% 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.	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	1	2	0.1	0.20	0.1	0.50	0.2	0.3
45-49	5	1	0.3	0.36	0.1	0.25	0.5	0.1
50-54	13	3	1.0	0.50	0.2	0.50	0.7	0.2
55-59	17	2	1.6	0.39	0.2	0.13	0.5	0.1
60-64	26	9	2.6	0.76	0.8	0.90	0.5	0.3
65-69	20	3	2.1	0.63	0.3	0.20	0.3	0.1
70-74	19	2	2.1	1.12	0.2	0.22	0.2	0.0
75-79	10	3	1.8	0.91	0.4	0.60	0.1	0.0
80-84	3	1	0.9	0.75	0.2	0.33	0.0	0.0
85+	2	5	0.9	0.67	0.9	1.25	0.0	0.1
All ages	116	31					0.2	0.1

Mortality					
Raw	0.6	0.59	0.2	0.40
WS	0.4	0.55	0.1	0.38
ES	0.5	0.56	0.1	0.38
BRD-S	0.6	0.59	0.1	0.39

PYLL-70		
per 100,000	5.1	1.5
ES	4.6	1.2
AYLL-70	10.1	11.5

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	8	5.2					8	100.0
C09-C10	Oropharynx	12	7.8			3	25.0	9	75.0
C12-C13	Hypopharynx	11	7.2	2	18.2	4	36.4	5	45.5
C15	Oesophagus	24	15.7	3	12.5	4	16.7	17	70.8
C16	Stomach	4	2.6	1	25.0			3	75.0
C18	Colon	9	5.9	4	44.4			5	55.6
C19-C20	Rectum	9	5.9	2	22.2	1	11.1	6	66.7
C22	Liver	5	3.3					5	100.0
C32	Larynx	8	5.2	4	50.0	2	25.0	2	25.0
C33-C34	Lung	25	16.3	5	20.0	4	16.0	16	64.0
C44	Skin others	10	6.5	4	40.0	4	40.0	2	20.0
C61	Prostate	7	4.6	4	57.1			3	42.9
C67	Bladder	3	2.0	2	66.7			1	33.3
C76-C79	CUP	3	2.0	1	33.3	1	33.3	1	33.3
C82-C85	NHL	5	3.3	2	40.0			3	60.0
Other primaries		10	6.5	3	30.0	1	10.0	6	60.0
All mult. primaries		153	100.0	37	24.2	24	15.7	92	60.1

Multiple primaries with number of cases 1 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	4	10.0			1	25.0	3	75.0
C09-C10 Oropharynx	4	10.0			1	25.0	3	75.0
C12-C13 Hypopharynx	1	2.5			1	100.0		
C14 ENT cancer	2	5.0			1	50.0	1	50.0
C15 Oesophagus	8	20.0	1	12.5	1	12.5	6	75.0
C16 Stomach	1	2.5					1	100.0
C18 Colon	2	5.0					2	100.0
C21 Anus/canal	1	2.5					1	100.0
C22 Liver	1	2.5	1	100.0				
C30-C31 Sinuses	3	7.5	1	33.3			2	66.7
C32 Larynx	2	5.0	1	50.0			1	50.0
C33-C34 Lung	2	5.0					2	100.0
C50 Breast	4	10.0	2	50.0			2	50.0
C54 Corpus uteri	1	2.5	1	100.0				
C56 Ovary	1	2.5					1	100.0
C67 Bladder	1	2.5	1	100.0				
C70-C72 CNS cancer	2	5.0					2	100.0
All mult. primaries	40	100.0	8	20.0	5	12.5	27	67.5

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.	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	1	2	0.1	0.20	0.1	0.50	0.2	0.4
45-49	4	1	0.3	0.33	0.1	0.25	0.4	0.1
50-54	9	3	0.7	0.53	0.2	0.75	0.6	0.2
55-59	16	1	1.5	0.48	0.1	0.08	0.6	0.0
60-64	21	7	2.1	0.84	0.7	1.00	0.5	0.2
65-69	14	2	1.5	0.67	0.2	0.22	0.2	0.0
70-74	13	2	1.4	1.30	0.2	0.25	0.2	0.0
75-79	5	1	0.9	0.71	0.1	0.50	0.1	0.0
80-84	2		0.6	1.00	0.0		0.0	
85+	1	5	0.4	0.50	0.9	1.25	0.0	0.1
All ages	86	24					0.2	0.1
Mortality								
Raw			0.5	0.61	0.1	0.41		
WS			0.3	0.58	0.1	0.39		
ES			0.4	0.59	0.1	0.39		
BRD-S			0.4	0.61	0.1	0.38		
PYLL-70								
per 100,000			4.2		1.3			
ES			3.7		1.0			
AYLL-70			10.3		12.5			

* 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		2	0.0		0.1	0.50		0.4
45-49	3	1	0.2	0.33	0.1	0.25	0.3	0.1
50-54	5	2	0.4	0.33	0.2	0.50	0.3	0.2
55-59	11	1	1.0	0.41	0.1	0.09	0.5	0.1
60-64	11	4	1.1	0.55	0.4	0.57	0.3	0.2
65-69	10	2	1.0	0.53	0.2	0.25	0.2	0.1
70-74	6	2	0.7	1.00	0.2	0.25	0.1	0.0
75-79	4	1	0.7	0.57	0.1	1.00	0.1	0.0
80-84	1		0.3	0.50	0.0		0.0	
85+	1	5	0.4	0.50	0.9	1.25	0.0	0.1
All ages	52	20					0.2	0.1
Mortality								
Raw			0.3	0.45	0.1	0.36		
WS			0.2	0.42	0.1	0.32		
ES			0.2	0.43	0.1	0.32		
BRD-S			0.3	0.44	0.1	0.32		
PYLL-70								
per 100,000			2.5		1.0			
ES			2.2		0.8			
AYLL-70			10.0		13.3			

* See corresponding tables with multiple primaries.

ICD-10 C05: Malignant neoplasm of palate
Age distribution and age-specific mortality 2007 - 2014 (Males: 116, Females: 31)
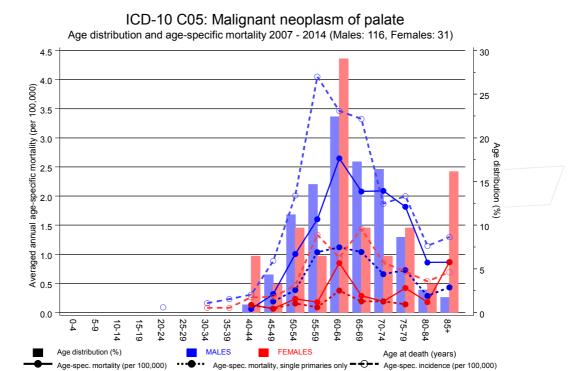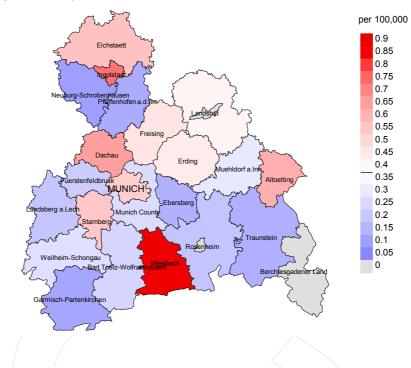
Figure 18. Distribution of age at death (bars) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

The difference between age at diagnosis (Table 3) and age at palate 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
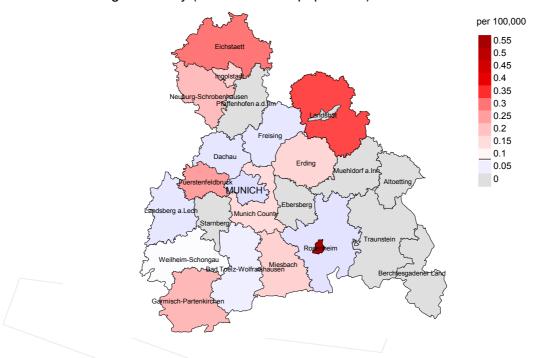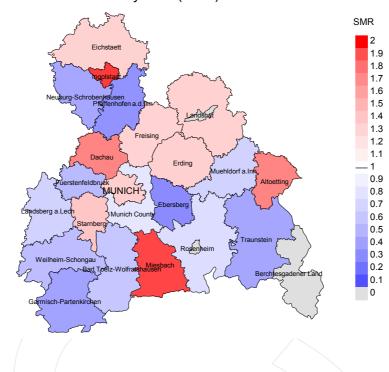
Figure 19a. Map of cancer mortality (world standard population) by county averaged for period 2007 to 2014. According to their individual mortality rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (males 0.4/100,000 WS N=115, females 0.1/100,000 WS N=30).

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 0 women died from palate 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 1.0/100,000.

Standardized mortality ratio (SMR) 2007 - 2014: Males

Standardized mortality ratio (SMR) 2007 - 2014: Females
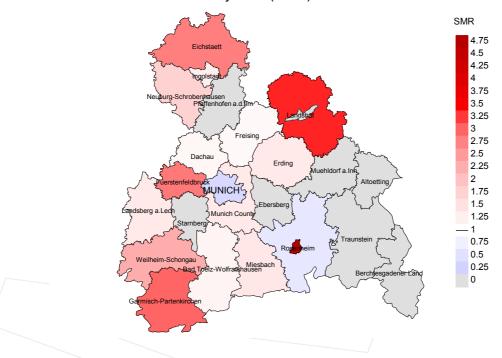
Figure 19b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2014. According to their individual SMR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (males N=115, females N=30).

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 0 women died from palate 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 6.58, 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

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