

# Munich Cancer Registry



- ▶ Survival
- ▶ Selection Matrix
- ▶ Homepage
- ▶ *Deutsch*

## ICD-10 C02-C06: Oral cavity cancer

### Incidence and Mortality

Year of diagnosis	1998-2016
Patients	3,354
Diseases	3,375
Creation date	08/21/2018
Export date	08/09/2018
Population	4.81 m





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<https://www.tumorregister-muenchen.de/en>

<https://www.tumorregister-muenchen.de/en/facts/base/bC0206E-ICD-10-C02-C06-Oral-cavity-cancer-incidence-and-mortality.pdf>

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**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<sup>#</sup>, with a total of 4.69 million inhabitants, account for the frequency of cancer diseases<sup>##</sup> 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<sup>###</sup> 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](mailto:tumor@ibe.med.uni-muenchen.de).

Munich Cancer Registry, August 2018

<sup>#</sup> 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 2.65 million to 4.10 in 2002, and to 4.69 million in 2007).

<sup>##</sup> 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.

<sup>###</sup> 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
C02	Other and unspecified parts of tongue Excl.: Topography code C02.4 Lingual tonsil
C03	Gum
C04	Floor of mouth
C05	Palate Excl.: Topography code C05.1 Soft palate, NOS C05.2 Uvula
C06	Other and unspecified parts of mouth

## INCIDENCE

Table 1

Cases with invasive cancer by year of diagnosis, proportions of DCO, further malignancies, deaths, and active follow-up (ALL PATIENTS) (incl. DCO)

Year of diagnosis	All cases n	DCO cases n	Prop. DCO %	Prop. at least 1 further malign. prior + synchron. %	Prop. at least 1 further malign. after %	Prop. deaths %	Prop. actively followed %
1998	124	6	4.8	12.9	17.2	81.5	99.2
1999	131	4	3.1	14.5	17.1	83.2	95.4
2000	129	4	3.1	12.8	16.6	79.1	98.4
2001	135	6	4.4	12.3	16.5	80.7	98.5
2002	190	12	6.3	13.5	16.0	73.2	97.9 #
2003	192	9	4.7	13.9	15.7	71.4	97.9
2004	191	6	3.1	14.1	14.9	74.9	96.9
2005	162	5	3.1	14.2	14.2	71.0	95.7
2006	196	3	1.5	14.2	14.0	70.4	94.9
2007	226	9	4.0	13.9	13.3	67.3	83.2 #
2008	218	3	1.4	14.5	12.4	59.2	76.1
2009	232	4	1.7	14.9	11.6	59.1	78.0
2010	251	12	4.8	14.8	10.9	55.8	77.3
2011	182	5	2.7	15.1	9.5	48.4	71.4
2012	227	7	3.1	15.4	8.5	42.7	72.2
2013	248	6	2.4	15.6	7.8	42.3	75.4
2014	180	9	5.0	15.8	7.7	45.6	85.0
2015	102	5	4.9	16.1	6.5	36.3	98.0
2016	59	3	5.1	16.4	7.3	28.8	67.8 ##
1998-2016	3375	118	3.5	16.4	17.2	61.5	86.3

3,375 cases diagnosed 1998-2016 are related to a total of 3,354 patients. Currently, in 1,097 (32.7 %) of these 3,354 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 829 / 206 / 62 (24.7 % / 6.1 % / 1.8 %) patients exist having 2 / 3 / 4+ malignancies.

# 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 retrieved from the respective headings.

How to interpret:

In 2014, a subgroup of 180 cases has been diagnosed, of which 15.8 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 7.7 % of cases, at least one new malignancy has occurred during the follow-up period (all numbers refer to the date of the database export, see cover sheet).

Table 1a

Cases with invasive cancer by year of diagnosis, proportions of DCO, further malignancies, deaths, and active follow-up (MALES) (incl. DCO)

Year of diagnosis	Males n	Males %	DCO cases n	Prop. DCO %	Prop. at least 1 further malign. prior + synchron. %	Prop. at least 1 further malign. after %	Prop. deaths %	Prop. actively followed %
1998	87	70.2	4	4.6	12.6	17.9	82.8	98.9
1999	80	61.1	1	1.3	15.0	17.8	87.5	96.3
2000	102	79.1	4	3.9	13.0	17.3	84.3	99.0
2001	92	68.1	5	5.4	12.5	17.2	82.6	98.9
2002	126	66.3	7	5.6	13.3	16.8	73.8	97.6 #
2003	136	70.8	7	5.1	14.0	16.3	73.5	98.5
2004	137	71.7	3	2.2	14.2	15.6	75.2	97.1
2005	105	64.8	2	1.9	14.3	14.9	71.4	95.2
2006	130	66.3	2	1.5	14.4	14.9	78.5	95.4
2007	151	66.8	6	4.0	14.4	14.0	71.5	85.4 #
2008	140	64.2	2	1.4	14.9	13.2	61.4	76.4
2009	153	65.9	2	1.3	15.2	12.4	63.4	78.4
2010	170	67.7	9	5.3	15.2	11.6	57.1	77.6
2011	110	60.4	4	3.6	15.5	10.7	51.8	71.8
2012	144	63.4	5	3.5	15.9	9.0	45.8	73.6
2013	164	66.1	5	3.0	16.2	8.1	42.1	72.0
2014	123	68.3	6	4.9	16.6	7.9	49.6	86.2
2015	71	69.6	4	5.6	17.0	6.3	33.8	97.2
2016	44	74.6	2	4.5	17.3	9.3	31.8	68.2 ##
1998-2016	2265	67.1	80	3.5	17.3	17.9	64.3	86.8

2,265 cases diagnosed 1998-2016 are related to a total of 2,254 patients. Currently, in 769 (34.1 %) of these 2,254 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 564 / 153 / 52 (25.0 % / 6.8 % / 2.3 %) patients exist having 2 / 3 / 4+ malignancies.

# 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 retrieved from the respective headings.

How to interpret:

In 2014, a subgroup of 123 cases has been diagnosed, of which 16.6 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 7.9 % of cases, at least one new malignancy has occurred during the follow-up period (all numbers refer to the date of the database export, see cover sheet).

Table 1b

Cases with invasive cancer by year of diagnosis, proportions of DCO, further malignancies, deaths, and active follow-up (FEMALES) (incl. DCO)

Year of diagnosis	Females n	Females %	DCO cases n	Prop. DCO %	Prop. at least 1 further malign. prior + synchron. %	Prop. at least 1 further malign. after %	Prop. deaths %	Prop. actively followed %
1998	37	29.8	2	5.4	13.5	15.8	78.4	100.0
1999	51	38.9	3	5.9	13.6	15.6	76.5	94.1
2000	27	20.9			12.2	15.2	59.3	96.3
2001	43	31.9	1	2.3	12.0	14.9	76.7	97.7
2002	64	33.7	5	7.8	14.0	14.3	71.9	98.4 #
2003	56	29.2	2	3.6	13.7	14.5	66.1	96.4
2004	54	28.3	3	5.6	13.9	13.5	74.1	96.3
2005	57	35.2	3	5.3	13.9	12.7	70.2	96.5
2006	66	33.7	1	1.5	13.8	12.4	54.5	93.9
2007	75	33.2	3	4.0	12.8	12.0	58.7	78.7 #
2008	78	35.8	1	1.3	13.7	10.9	55.1	75.6
2009	79	34.1	2	2.5	14.3	10.1	50.6	77.2
2010	81	32.3	3	3.7	13.8	9.6	53.1	76.5
2011	72	39.6	1	1.4	14.3	7.3	43.1	70.8
2012	83	36.6	2	2.4	14.3	7.3	37.3	69.9
2013	84	33.9	1	1.2	14.5	7.3	42.9	82.1
2014	57	31.7	3	5.3	14.3	7.2	36.8	82.5
2015	31	30.4	1	3.2	14.3	7.3	41.9	100.0
2016	15	25.4	1	6.7	14.4	0.0	20.0	66.7 ##
1998-2016	1110	32.9	38	3.4	14.4	15.8	55.9	85.2

1,110 cases diagnosed 1998-2016 are related to a total of 1,100 patients. Currently, in 328 (29.8 %) of these 1,100 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 265 / 53 / 10 (24.1 % / 4.8 % / 0.9 %) patients exist having 2 / 3 / 4+ malignancies.

# 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 retrieved from the respective headings.

How to interpret:

In 2014, a subgroup of 57 cases has been diagnosed, of which 14.3 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 7.2 % of cases, at least one new malignancy has occurred during the follow-up period (all numbers refer to the date of the database export, see cover sheet).

Table 2

Incidence measures by year of diagnosis including DCO cases  
(with respect to registry area expansion from 2.65 to 4.10 m as of 2002,  
and from 4.10 to 4.81 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	87	37	7.9	3.1	5.3	1.7	7.2	2.4	8.0	2.8
1999	80	51	7.1	4.3	4.7	2.5	6.5	3.4	7.1	3.8
2000	102	27	9.0	2.2	6.0	1.3	8.1	1.8	8.9	2.0
2001	92	43	7.9	3.5	5.1	1.9	7.0	2.7	7.9	3.0
2002	126	64	6.8	3.3	4.4	1.7	5.9	2.5	6.5	2.8
2003	136	56	7.3	2.8	4.8	1.6	6.6	2.2	7.1	2.5
2004	137	54	7.3	2.7	4.7	1.3	6.4	1.8	7.1	2.3
2005	105	57	5.5	2.9	3.5	1.6	4.7	2.2	5.3	2.5
2006	130	66	6.8	3.3	4.2	1.8	6.0	2.5	6.9	2.9
2007	151	75	6.8	3.2	4.3	1.7	5.9	2.4	6.5	2.8
2008	140	78	6.3	3.4	3.9	1.9	5.3	2.6	6.0	3.0
2009	153	79	6.9	3.4	4.1	1.8	5.7	2.5	6.4	2.9
2010	170	81	7.5	3.5	4.7	1.7	6.3	2.4	7.0	2.8
2011	110	72	4.9	3.1	3.0	1.6	4.1	2.2	4.5	2.5
2012	144	83	6.3	3.5	3.8	1.9	5.2	2.6	5.8	3.0
2013	164	84	7.1	3.5	4.2	1.7	5.8	2.4	6.5	2.8
2014	123	57	5.3	2.4	3.1	1.1	4.3	1.6	4.8	1.9
2015	71	31	3.0	1.3	1.8	0.6	2.4	0.8	2.7	1.0
2016	44	15	1.8	0.6	1.0	0.3	1.4	0.4	1.7	0.5
1998-2016	2265	1110	6.2	2.9	3.8	1.5	5.2	2.1	5.8	2.4

The computation of the incidence measures includes all cancers, irrespective of first or subsequent malignancy.



Table 3

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

Year of diagnosis	Cases n	Std.		Min.	Max.	10%	25%	Median		
		Mean	dev.					50%	75%	90%
1998	124	59.3	12.2	0.9	91.4	46.4	52.1	58.0	66.4	76.3
1999	131	61.0	13.0	25.6	95.7	47.1	52.8	59.1	67.1	77.7
2000	129	58.8	11.4	33.5	85.8	45.0	50.6	58.1	66.6	74.1
2001	135	62.0	12.2	33.7	96.4	45.7	53.5	60.7	69.3	78.0
2002	190	61.2	12.4	26.4	99.0	45.6	53.0	60.9	68.0	78.7
2003	192	60.0	12.8	10.7	98.2	45.7	52.2	59.2	66.7	78.7
2004	191	62.0	12.9	29.5	97.9	45.5	53.4	61.9	70.5	79.8
2005	162	60.9	12.9	22.8	98.7	45.5	52.1	60.7	67.7	80.8
2006	196	62.7	12.9	22.6	96.2	47.5	55.0	61.5	71.6	81.2
2007	226	62.0	12.7	26.0	101	46.0	53.7	61.9	70.4	78.1
2008	218	62.6	11.9	21.8	100	48.8	54.0	62.4	69.5	78.1
2009	232	62.6	12.4	29.6	98.4	47.5	53.8	62.6	71.0	79.9
2010	251	62.4	13.3	21.9	92.8	46.9	52.1	62.0	70.7	81.5
2011	182	62.4	13.7	27.0	96.9	43.5	53.1	63.0	72.0	78.8
2012	227	62.5	12.6	21.5	100	48.0	54.0	63.9	71.1	77.6
2013	248	64.2	12.2	28.1	95.5	48.9	56.2	64.2	72.1	81.1
2014	180	64.0	11.8	28.7	90.9	48.2	55.5	64.2	71.4	78.6
2015	102	64.8	11.3	40.2	86.8	50.3	56.1	64.2	73.4	80.8
2016	59	65.1	13.8	21.1	90.0	46.4	56.1	63.9	75.2	82.8
1998-2016	3375	62.1	12.6	0.9	101	46.7	53.5	61.7	70.3	79.1

Table 3a

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

Year of diagnosis	Cases n	Std.		Min.	Max.	10%	25%	Median		
		Mean	dev.					50%	75%	90%
1998	87	57.2	11.5	0.9	81.3	45.5	51.3	56.5	63.8	72.0
1999	80	59.2	12.1	33.3	90.8	46.8	51.2	57.4	64.2	80.2
2000	102	58.1	10.0	35.8	85.5	45.7	50.2	58.1	65.0	72.0
2001	92	60.0	12.1	33.7	94.3	44.5	51.0	59.8	64.4	77.4
2002	126	59.0	10.7	26.4	92.2	45.2	52.0	60.1	64.5	72.1
2003	136	58.6	10.5	28.1	86.1	45.8	52.7	57.7	64.1	71.9
2004	137	59.4	11.6	29.7	88.7	44.9	52.6	59.8	65.4	75.0
2005	105	59.0	11.6	36.8	85.0	43.3	49.6	58.2	66.6	77.2
2006	130	61.5	12.2	23.9	92.0	46.8	53.8	59.7	69.4	77.6
2007	151	60.3	11.6	26.0	101	46.0	52.3	59.7	67.7	74.8
2008	140	61.6	11.2	21.8	100	48.4	53.5	62.0	68.6	75.2
2009	153	62.0	10.8	30.2	88.1	48.0	54.5	62.2	69.7	74.7
2010	170	60.3	12.4	24.5	92.8	45.4	51.8	59.8	69.0	75.7
2011	110	60.3	13.1	27.0	93.0	43.5	52.6	58.7	69.7	78.0
2012	144	61.3	11.3	21.6	85.9	48.0	52.9	62.3	69.4	75.1
2013	164	62.2	10.4	30.0	85.0	49.3	55.5	62.4	69.7	75.8
2014	123	62.4	11.2	28.7	90.0	47.3	54.5	62.5	70.4	76.5
2015	71	63.2	10.0	40.2	86.3	50.3	56.1	63.5	67.9	76.3
2016	44	64.7	13.7	21.1	90.0	50.7	56.2	63.8	75.3	81.0
1998-2016	2265	60.5	11.5	0.9	101	46.4	52.8	60.0	67.9	75.5

Table 3b

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

Year of diagnosis	Cases n	Std. dev.		Median		Percentiles				
		Mean	dev.	Min.	Max.	10%	25%	50%	75%	90%
1998	37	64.0	12.6	32.0	91.4	49.6	57.5	61.8	75.8	79.5
1999	51	63.8	14.0	25.6	95.7	48.3	56.1	65.4	73.0	77.7
2000	27	61.3	15.4	33.5	85.8	39.8	50.6	59.6	76.3	84.8
2001	43	66.4	11.3	44.0	96.4	53.2	59.8	63.7	71.3	84.0
2002	64	65.5	14.2	35.8	99.0	50.0	54.8	62.5	76.2	82.9
2003	56	63.4	16.8	10.7	98.2	44.8	51.1	62.3	78.2	83.7
2004	54	68.6	13.9	29.5	97.9	48.9	60.2	69.1	78.9	84.3
2005	57	64.5	14.4	22.8	98.7	50.2	54.9	62.3	76.0	83.7
2006	66	65.2	14.1	22.6	96.2	48.2	56.0	63.1	77.0	84.2
2007	75	65.5	14.3	31.0	98.2	46.1	55.7	65.0	75.7	83.6
2008	78	64.4	12.8	26.7	97.6	49.7	55.4	64.0	72.5	81.1
2009	79	63.8	15.1	29.6	98.4	43.1	53.6	64.9	75.2	82.8
2010	81	66.9	14.0	21.9	91.8	50.4	56.2	66.9	74.6	87.0
2011	72	65.7	14.2	31.2	96.9	47.7	57.7	67.3	75.1	84.1
2012	83	64.5	14.6	21.5	100	47.5	56.5	64.9	73.3	82.3
2013	84	68.2	14.4	28.1	95.5	47.2	58.9	67.9	77.5	88.3
2014	57	67.6	12.4	33.5	90.9	51.4	59.1	68.6	74.7	84.7
2015	31	68.2	13.3	43.8	86.8	51.3	54.5	72.0	81.6	84.1
2016	15	66.1	14.5	42.4	89.1	46.4	55.7	67.3	75.0	87.5
1998-2016	1110	65.5	14.1	10.7	100	47.9	56.0	65.2	75.3	83.9

Table 4

Age distribution by 5-year age group and sex for period 2007-2016  
(incl. DCO)

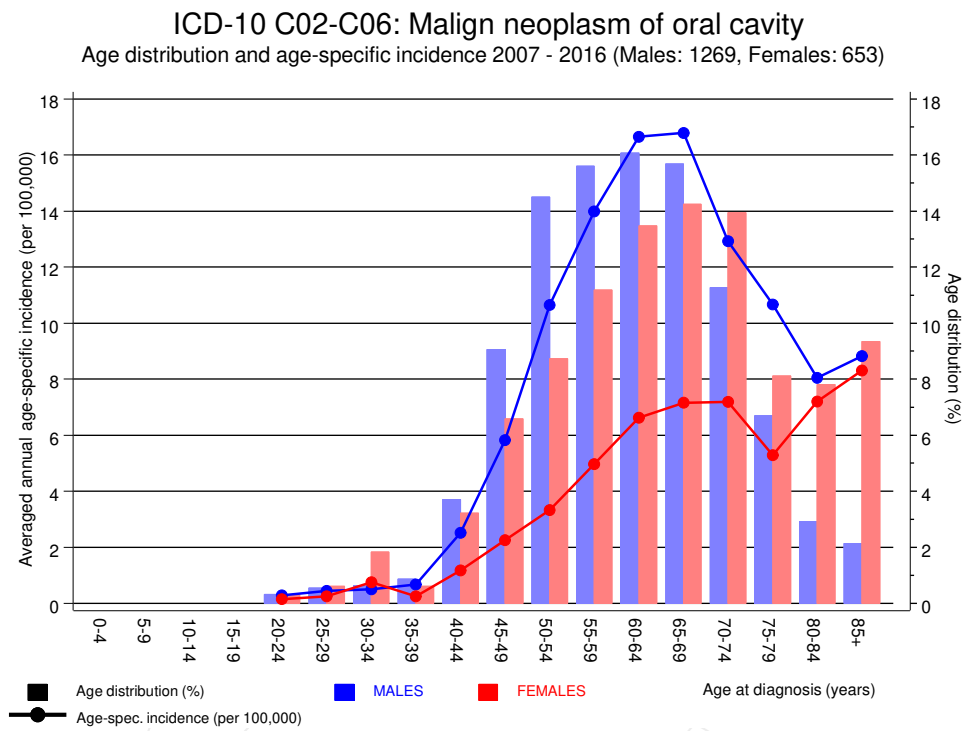
Age at diagnosis Years	Cases			Males			Females		
	n	%	Cum.%	n	%	Cum.%	n	%	Cum.%
0-4									
5-9									
10-14									
15-19									
20-24	6	0.3	0.3	4	0.3	0.3	2	0.3	0.3
25-29	11	0.6	0.9	7	0.6	0.9	4	0.6	0.9
30-34	20	1.0	1.9	8	0.6	1.5	12	1.8	2.7
35-39	15	0.8	2.7	11	0.9	2.4	4	0.6	3.4
40-44	68	3.5	6.2	47	3.7	6.1	21	3.2	6.6
45-49	158	8.2	14.4	115	9.1	15.1	43	6.6	13.1
50-54	242	12.6	27.0	185	14.6	29.7	57	8.7	21.8
55-59	271	14.1	41.1	198	15.6	45.3	73	11.1	33.0
60-64	292	15.2	56.3	204	16.1	61.3	88	13.4	46.4
65-69	292	15.2	71.4	199	15.7	77.0	93	14.2	60.6
70-74	235	12.2	83.6	143	11.3	88.3	92	14.0	74.7
75-79	138	7.2	90.8	85	6.7	95.0	53	8.1	82.7
80-84	89	4.6	95.4	37	2.9	97.9	52	7.9	90.7
85+	88	4.6	100.0	27	2.1	100.0	61	9.3	100.0
All ages	1925	100.0		1270	100.0		655	100.0	

Table 5

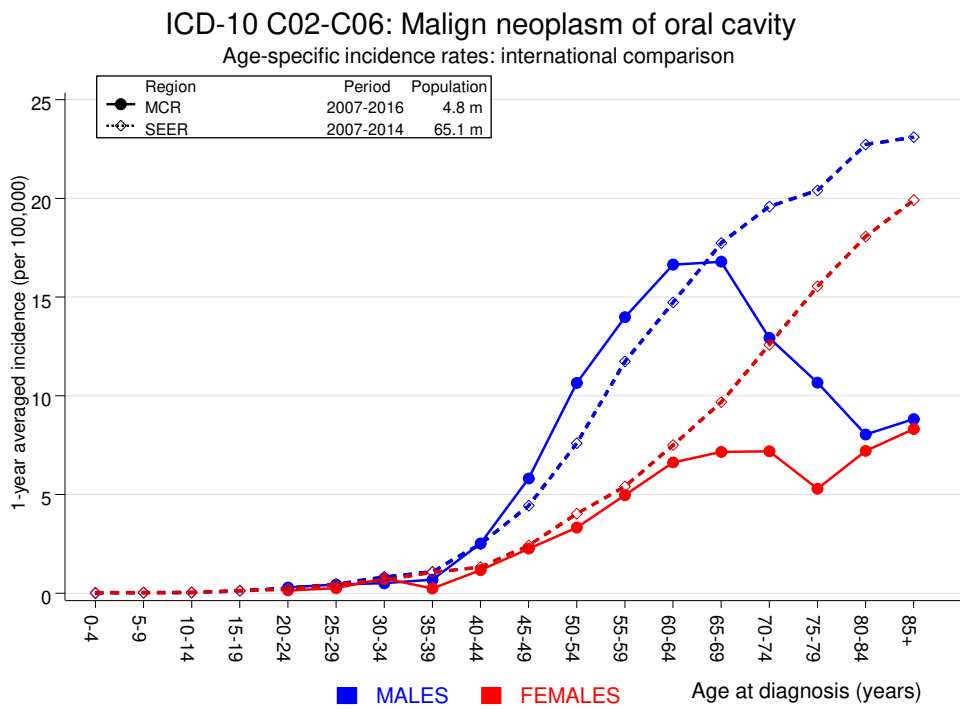
Age-specific incidence, DCO rate and proportion of all cancers for period 2007-2016

Age at diagnosis Years	Males n	Females n	Males Age- spec. incid.	Females Age- spec. incid.	Males DCO rate n=45 %	Females DCO rate n=18 %	Males	Females
							Prop.all cancers n=113978 %	Prop.all cancers n=112253 %
0- 4								
5- 9								
10-14								
15-19								
20-24	4	2	0.3	0.1			0.9	0.5
25-29	7	4	0.4	0.3			1.0	0.5
30-34	8	12	0.5	0.8			0.8	0.8
35-39	11	4	0.7	0.3			0.8	0.2
40-44	47	21	2.5	1.2			2.2	0.5
45-49	115	43	5.8	2.3			2.9	0.6
50-54	184	57	10.6	3.3	1.1		3.0	0.7
55-59	198	73	14.0	5.0	2.5	5.5	2.1	0.8
60-64	204	88	16.7	6.6	3.9	2.3	1.6	0.8
65-69	199	93	16.8	7.2	4.5	2.2	1.1	0.7
70-74	143	91	12.9	7.2	6.3		0.7	0.6
75-79	85	53	10.7	5.3	5.9		0.5	0.4
80-84	37	51	8.0	7.2	2.7	2.0	0.3	0.5
85+	27	61	8.8	8.3	22.2	14.8	0.3	0.5
All ages	1269	653			3.5	2.8	1.1	0.6
Incidence								
Raw			5.6	2.8				
WS			3.3	1.4				
ES			4.6	2.0				
BRD-S			5.1	2.3				

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 (males: mean=61.5 yrs, median=61.8 yrs; females: mean=65.9 yrs, median=66.4 yrs) 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>.

Table 7a

Standardized incidence ratio (SIR, with 95% confidence limits),  
excess absolute risk (EAR) and DCO rate of further malignancies  
for period 1998–2016

## MALES

Diagnosis	Observed n	Expected n	SIR	CI 95%	CI 95%	EAR	DCO %
C03-C06 Oral cavity	10	1.0	9.7	4.6	17.8 #	12.7	
C09-C10 Oropharynx	54	1.3	40.9	30.7	53.3 #	74.3	1.9
C12-C13 Hypopharynx	45	0.7	62.7	45.8	83.9 #	62.5	11.1
C15 Oesophagus	50	1.9	27.0	20.1	35.6 #	68.0	6.0
C16 Stomach	7	3.1	2.3	0.9	4.7	5.5	14.3
C17 Small intestine	2	0.5	4.1	0.5	14.9	2.1	50.0
C18 Colon	25	7.3	3.4	2.2	5.0 #	25.0	8.0
C19-C20 Rectum	15	4.8	3.1	1.7	5.1 #	14.4	
C21 Anus/canal	3	0.2	13.7	2.8	40.1 #	3.9	
C22 Liver	15	2.4	6.2	3.4	10.2 #	17.7	13.3
C25 Pancreas	8	3.0	2.7	1.2	5.3 #	7.1	
C30-C31 Sinuses	4	0.2	23.9	6.5	61.1 #	5.4	25.0
C32 Larynx	29	1.1	27.1	18.1	38.9 #	39.4	13.8
C33-C34 Lung	107	10.3	10.4	8.5	12.6 #	136.5	12.1
C43 Malign. melanoma	11	4.0	2.8	1.4	5.0 #	9.9	9.1
C46,C49 Soft tissue	2	0.5	4.2	0.5	15.1	2.1	
C61 Prostate	29	24.0	1.2	0.8	1.7	7.1	6.9
C64 Kidney	12	3.2	3.8	2.0	6.6 #	12.5	
C65 Renal pelvis	2	0.3	6.4	0.8	23.1	2.4	
C67 Bladder	9	3.2	2.8	1.3	5.3 #	8.2	11.1
C73 Thyroid	5	0.8	6.4	2.1	14.9 #	6.0	
C76-C79 CUP	6	1.4	4.4	1.6	9.5 #	6.5	
C81 Hodgkin lymphoma	2	0.2	8.7	1.1	31.5 #	2.5	50.0
C82-C85 NHL	9	3.3	2.7	1.2	5.2 #	8.0	22.2
C91-C96 Leukaemia	4	1.2	3.3	0.9	8.6	4.0	
Others, specified	12	3.9	3.1	1.6	5.3 #	11.4	8.3
Not observed	0	1.7	0.0	0.0	2.2	-2.4	
All further malignancies	477	85.3	5.6	5.1	6.1 #	552.8	8.6

Patients	2163
Median age at next malignancy (years)	64.2
Person-years	7086
Mean observation time (years)	3.3
Median observation time (years)	1.8

# The occurrence of further malignancy listed is statistically significant.

Observed further malignancies with count 1 are pooled in category "Others, specified".

Table 7b

Standardized incidence ratio (SIR, with 95% confidence limits),  
excess absolute risk (EAR) and DCO rate of further malignancies  
for period 1998–2016

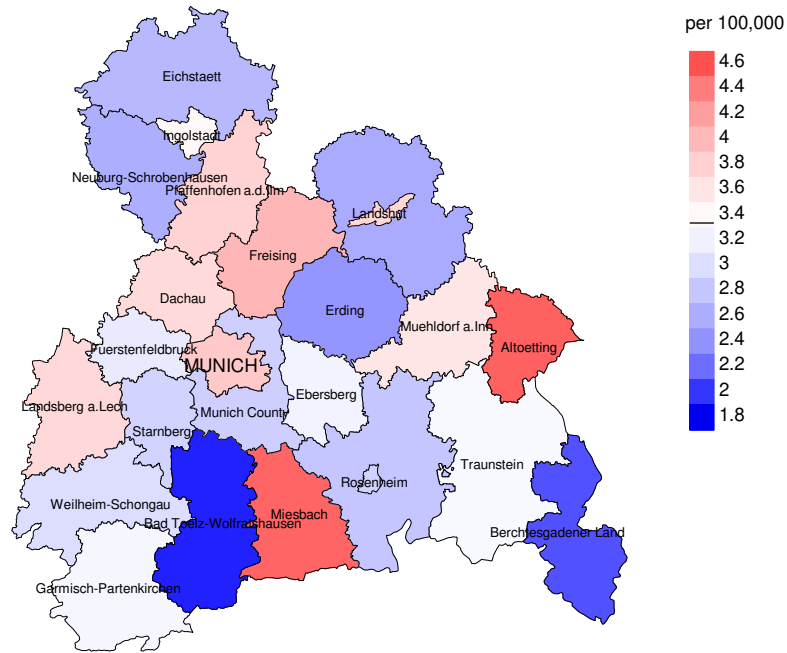
## FEMALES

Diagnosis	Observed n	Expected n	SIR	CI 95%	CI 95%	EAR	DCO %
C03-C06 Oral cavity	9	0.3	34.2	15.7	65.0 #	21.9	
C07-C08 Salivary gland	2	0.1	30.1	3.6	108.9 #	4.9	
C09-C10 Oropharynx	20	0.2	105.1	64.2	162.4 #	49.7	
C12-C13 Hypopharynx	8	0.1	152.2	65.7	299.8 #	20.0	50.0
C14 ENT cancer	2	0.0	287.7	34.8	1039 #	5.0	100.0
C15 Oesophagus	14	0.3	50.2	27.4	84.2 #	34.5	7.1
C16 Stomach	3	1.4	2.1	0.4	6.2	4.0	33.3
C18 Colon	6	4.0	1.5	0.6	3.3	5.1	
C19-C20 Rectum	2	1.7	1.2	0.1	4.2	0.7	
C22 Liver	6	0.5	11.9	4.4	25.9 #	13.8	16.7
C23-C24 Bile	3	0.6	5.3	1.1	15.4 #	6.1	
C25 Pancreas	4	1.9	2.2	0.6	5.5	5.4	25.0
C30-C31 Sinuses	5	0.1	87.7	28.5	204.7 #	12.4	40.0
C32 Larynx	4	0.1	48.0	13.1	122.8 #	9.8	25.0
C33-C34 Lung	43	3.3	13.2	9.6	17.8 #	99.8	14.0
C43 Malign. melanoma	3	1.6	1.9	0.4	5.4	3.5	33.3
C50 Breast	19	13.3	1.4	0.9	2.2	14.4	
C51 Vulva	2	0.4	4.8	0.6	17.4	4.0	
C54 Corpus uteri	3	2.4	1.3	0.3	3.7	1.6	
C56 Ovary	4	1.7	2.3	0.6	5.9	5.7	
C67 Bladder	4	0.8	5.2	1.4	13.3 #	8.1	50.0
C70-C72 CNS cancer	2	0.6	3.4	0.4	12.5	3.6	50.0
C73 Thyroid	4	0.8	5.1	1.4	13.1 #	8.1	
C82-C85 NHL	6	1.6	3.7	1.4	8.1 #	11.0	
C90 Mult. myeloma	2	0.5	3.9	0.5	14.1	3.7	50.0
Others, specified	7	2.8	2.5	1.0	5.2 #	10.6	14.3
Not observed	0	2.0	0.0	0.0	1.8	-5.1	
All further malignancies	187	42.7	4.4	3.8	5.1 #	362.4	13.4
Patients		1050					
Median age at next malignancy (years)		68.5					
Person-years		3982					
Mean observation time (years)		3.8					
Median observation time (years)		2.4					

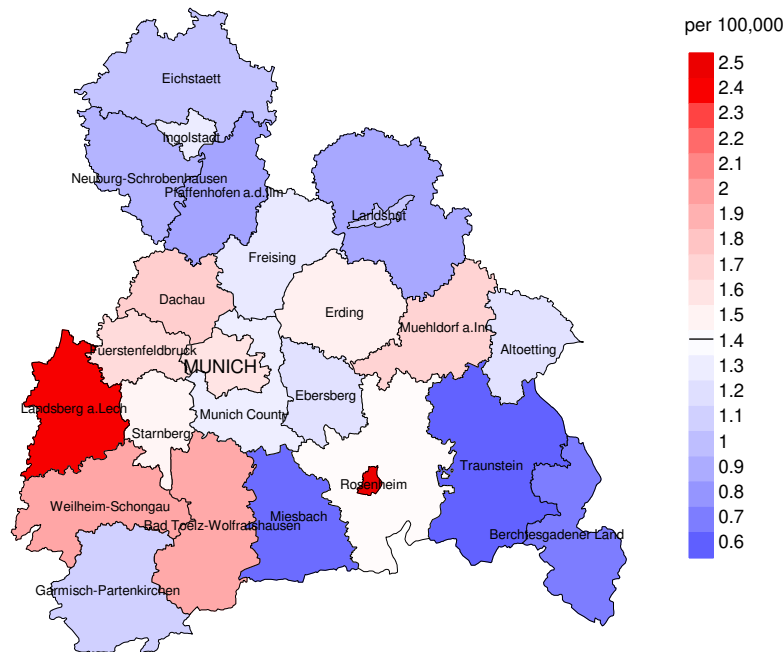
# The occurrence of further malignancy listed is statistically significant.

Observed further malignancies with count 1 are pooled in category "Others, specified".

Average incidence (world standard population) 2007 - 2016: Males



Average incidence (world standard population) 2007 - 2016: Females

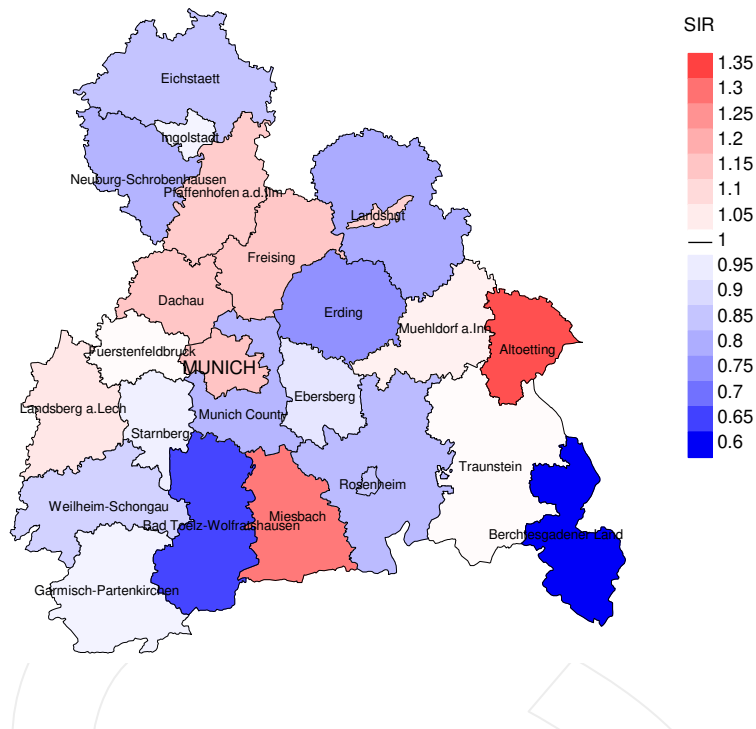


**Figure 8a.** Map of cancer incidence (world standard population, incl. DCO cases) by county averaged for period 2007 to 2016. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 3.3/100,000 WS N=1,269, females 1.4/100,000 WS N=653).

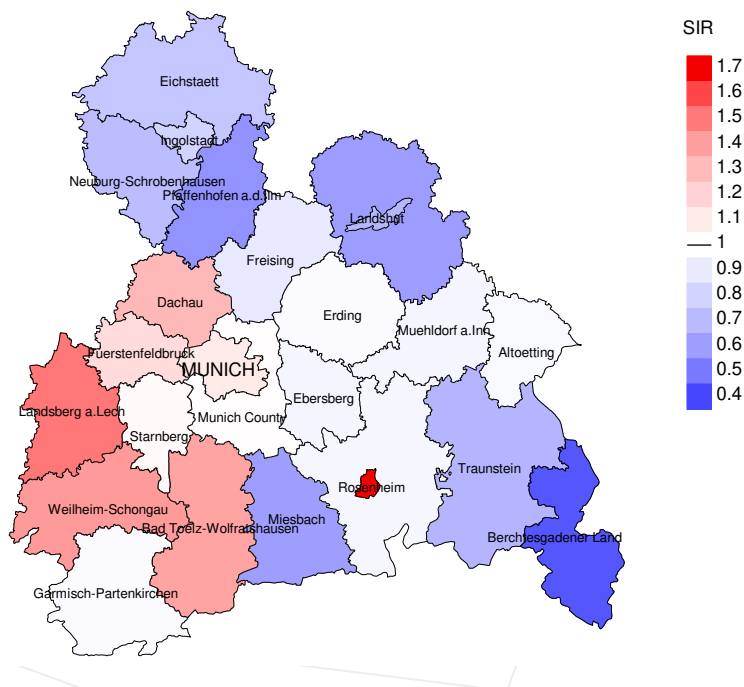
The results should be interpreted with caution! E.g., in county Ebersberg with a population of 66,416 female residents (averaged) in the period from 2007 to 2016 a total of 17 women were identified with newly diagnosed oral cavity cancer. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 1.2/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.5 and 2.5/100,000.



Standardized incidence ratio (SIR) 2007 - 2016: Males



Standardized incidence ratio (SIR) 2007 - 2016: Females



**Figure 8b.** Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2016. According to their individual SIR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=1,269, females N=653).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 66,416 female residents (averaged) in the period from 2007 to 2016 a total of 17 women were identified with newly diagnosed oral cavity cancer. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 0.95. Though, the value of this parameter may vary with an underlying probability of 99% between 0.46 and 1.72, and is therefore not statistically striking.

## MORTALITY

Table 9a

Annual cohorts: Incident cancers, follow-up status, proportion of DCO, deaths among the annual cohorts and proportion of available death certificates (with respect to registry area expansion from 2.65 to 4.10 m as of 2002, and from 4.10 to 4.81 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	124	99.2	4.8	101	81.5	94.1
1999	131	95.4	3.1	109	83.2	85.3
2000	129	98.4	3.1	102	79.1	96.1
2001	135	98.5	4.4	109	80.7	91.7
2002	190	97.9	6.3	139	73.2	97.8
2003	192	97.9	4.7	137	71.4	98.5
2004	191	96.9	3.1	143	74.9	95.1
2005	162	95.7	3.1	115	71.0	100.0
2006	196	94.9	1.5	138	70.4	97.8
2007	226	83.2	4.0	152	67.3	98.7
2008	218	76.1	1.4	129	59.2	96.1
2009	232	78.0	1.7	137	59.1	98.5
2010	251	77.3	4.8	140	55.8	98.6
2011	182	71.4	2.7	88	48.4	97.7
2012	227	72.2	3.1	97	42.7	96.9
2013	248	75.4	2.4	105	42.3	95.2
2014	180	85.0	5.0	82	45.6	95.1
2015	102	98.0	4.9	37	36.3	89.2
2016	59	67.8	5.1	17	28.8	76.5
1998-2016	3375	86.3	3.5	2077	61.5	96.0

Table 9b

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

(with respect to registry area expansion from 2.65 to 4.10 m as of 2002, and from 4.10 to 4.81 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	124	74	93.2	18	14.5
1999	131	70	87.1	14	10.7
2000	129	87	89.7	17	13.2
2001	135	117	88.9	23	17.0
2002	190	149	98.0	33	17.4
2003	192	151	98.0	28	14.6
2004	191	147	98.0	37	19.4
2005	162	134	98.5	18	11.1
2006	196	150	94.7	24	12.2
2007	226	158	98.1	33	14.6
2008	218	147	98.0	22	10.1
2009	232	189	97.4	28	12.1
2010	251	172	99.4	32	12.7
2011	182	170	97.6	23	12.6
2012	227	179	97.8	31	13.7
2013	248	173	98.8	41	16.5
2014	180	149	94.6	29	16.1
2015	102	158	99.4	18	17.6
2016	59	122	99.2	13	22.0
1998-2016	3375	2696	96.8	482	14.3

Table 9c

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 2.65 to 4.10 m as of 2002,  
and from 4.10 to 4.81 m as of 2007, respectively)

Year of death	Deaths n	Prop. cancer- related %	Prop. non-cancer- related %	Prop. cancer recorded on death certificate %
1998	74	71.6	28.4	88.4
1999	70	61.4	38.6	85.2
2000	87	64.4	35.6	88.5
2001	117	76.9	23.1	91.3
2002	149	75.2	24.8	89.7
2003	151	78.8	21.2	87.8
2004	147	76.9	23.1	88.9
2005	134	86.6	13.4	93.2
2006	150	71.3	28.7	85.2
2007	158	78.5	21.5	89.0
2008	147	79.6	20.4	90.3
2009	189	78.8	21.2	87.5
2010	172	79.7	20.3	92.4
2011	170	75.3	24.7	84.3
2012	179	78.8	21.2	89.7
2013	173	74.0	26.0	87.1
2014	149	72.5	27.5	84.4
2015	158	69.6	30.4	84.1
2016	122	71.3	28.7	83.5
1998-2016	2696	75.6	24.4	88.0

Table 10a

Medians of age at death according to the grouping in Table 9  
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	56	60.5	60.5	60.6	61.0
1999	54	55.8	56.8	53.1	54.1
2000	69	62.4	61.8	63.9	65.4
2001	89	60.5	60.4	61.6	60.5
2002	107	62.1	62.0	63.6	61.7
2003	107	63.5	63.1	69.3	63.5
2004	104	63.2	61.1	65.8	62.1
2005	83	65.7	65.2	76.5	65.4
2006	109	62.9	62.6	63.9	62.6
2007	119	62.8	61.5	67.7	62.2
2008	103	64.8	64.4	69.6	64.2
2009	127	67.0	65.1	71.5	65.5
2010	124	66.1	65.0	69.1	65.5
2011	122	67.3	65.4	70.3	64.9
2012	131	65.4	65.3	67.2	65.3
2013	109	66.5	63.6	74.0	64.7
2014	94	69.7	67.2	72.6	68.2
2015	109	67.2	67.2	67.1	67.1
2016	78	67.1	65.4	74.0	66.1
1998–2016	1894	64.7	63.6	68.4	64.0

Deaths of patients are considered to be cancer-related, in case that fact was recorded on the death certificate, or patients had suffered from metastasis or recurrence.

Table 10b

Medians of age at death according to the grouping in Table 9  
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	18	62.0	62.0	61.8	62.0
1999	16	76.3	65.8	82.3	65.8
2000	18	68.8	67.6	85.4	68.8
2001	28	69.6	69.6	67.4	69.6
2002	42	71.9	69.1	82.9	71.8
2003	44	71.0	70.3	76.5	70.9
2004	43	72.3	73.7	70.1	71.7
2005	51	69.2	67.5	87.2	68.5
2006	41	78.3	77.4	80.4	76.9
2007	39	75.1	73.5	84.4	72.0
2008	44	71.8	70.5	72.5	69.5
2009	62	70.3	68.4	84.0	69.6
2010	48	73.0	69.4	86.4	70.0
2011	48	73.3	71.9	73.4	71.8
2012	48	72.1	69.5	85.7	70.5
2013	64	74.3	72.8	81.1	73.7
2014	55	74.6	69.6	79.0	72.9
2015	49	73.2	72.1	85.7	72.2
2016	44	78.3	75.5	83.8	77.2
1998–2016	802	72.9	70.5	80.4	71.1

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 11a

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	41	3.7	0.47	2.4	0.45	3.3	0.46	3.9	0.49
1999	35	3.1	0.44	2.0	0.43	2.8	0.44	3.1	0.44
2000	45	4.0	0.44	2.4	0.40	3.6	0.44	4.3	0.48
2001	68	5.9	0.75	3.8	0.75	5.3	0.77	6.1	0.79
2002	80	4.3	0.63	2.6	0.60	3.7	0.63	4.3	0.66
2003	87	4.6	0.64	2.8	0.59	4.0	0.60	4.6	0.64
2004	80	4.3	0.58	2.7	0.57	3.7	0.58	4.2	0.59
2005	71	3.7	0.68	2.1	0.61	3.1	0.66	3.8	0.71
2006	80	4.2	0.62	2.6	0.62	3.6	0.60	4.1	0.59
2007	94	4.2	0.62	2.6	0.60	3.6	0.61	4.1	0.62
2008	87	3.9	0.62	2.3	0.59	3.2	0.61	3.8	0.64
2009	103	4.6	0.68	2.7	0.65	3.7	0.66	4.3	0.67
2010	96	4.3	0.56	2.5	0.53	3.5	0.55	3.9	0.56
2011	91	4.1	0.83	2.3	0.76	3.2	0.78	3.8	0.84
2012	104	4.6	0.72	2.5	0.66	3.6	0.69	4.1	0.71
2013	82	3.6	0.50	2.0	0.48	2.8	0.49	3.3	0.50
2014	74	3.2	0.60	1.7	0.54	2.4	0.56	2.8	0.59
2015	76	3.2	1.07	1.7	0.95	2.4	0.99	2.9	1.05
2016	55	2.3	1.25	1.3	1.33	1.8	1.31	2.1	1.25
1998-2016	1449	3.9	0.64	2.3	0.60	3.2	0.62	3.7	0.64

Table 11b

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	12	1.0	0.33	0.5	0.32	0.7	0.32	0.9	0.32
1999	8	0.7	0.16	0.3	0.14	0.5	0.14	0.6	0.15
2000	11	0.9	0.41	0.5	0.40	0.7	0.41	0.8	0.39
2001	22	1.8	0.51	0.9	0.45	1.2	0.46	1.6	0.52
2002	32	1.6	0.50	0.8	0.45	1.2	0.47	1.4	0.48
2003	33	1.7	0.59	0.8	0.53	1.2	0.56	1.5	0.59
2004	33	1.7	0.61	0.7	0.55	1.0	0.57	1.3	0.58
2005	45	2.3	0.79	1.1	0.68	1.6	0.72	1.9	0.75
2006	27	1.3	0.41	0.5	0.27	0.8	0.30	1.0	0.35
2007	30	1.3	0.40	0.5	0.31	0.8	0.33	1.0	0.36
2008	30	1.3	0.38	0.6	0.32	0.9	0.33	1.1	0.36
2009	46	2.0	0.59	0.9	0.52	1.3	0.55	1.6	0.54
2010	41	1.8	0.51	0.8	0.46	1.1	0.48	1.4	0.50
2011	37	1.6	0.51	0.7	0.43	1.0	0.44	1.1	0.45
2012	37	1.6	0.45	0.7	0.38	1.0	0.39	1.2	0.41
2013	46	1.9	0.55	0.8	0.47	1.1	0.48	1.4	0.51
2014	34	1.4	0.60	0.7	0.58	0.9	0.56	1.1	0.59
2015	34	1.4	1.10	0.6	0.96	0.8	0.98	1.0	1.01
2016	32	1.3	2.13	0.4	1.39	0.7	1.58	0.9	1.80
1998-2016	590	1.5	0.53	0.7	0.45	1.0	0.47	1.2	0.50

Table 12

Age distribution of age at death (cancer-related) for period 2007-2016  
(incl. multiple malignancies)

Age at death Years	Cases			Males			Females		
	n	%	Cum.%	n	%	Cum.%	n	%	Cum.%
0-4									
5-9									
10-14									
15-19									
20-24	2	0.2	0.2	1	0.1	0.1	1	0.3	0.3
25-29	2	0.2	0.3	1	0.1	0.2	1	0.3	0.5
30-34	2	0.2	0.5	1	0.1	0.3	1	0.3	0.8
35-39	5	0.4	0.9	2	0.2	0.6	3	0.8	1.6
40-44	21	1.7	2.6	15	1.7	2.3	6	1.6	3.3
45-49	59	4.8	7.4	50	5.8	8.1	9	2.5	5.7
50-54	105	8.5	15.9	88	10.2	18.3	17	4.6	10.4
55-59	156	12.7	28.6	131	15.2	33.5	25	6.8	17.2
60-64	187	15.2	43.9	140	16.2	49.8	47	12.8	30.0
65-69	224	18.2	62.1	164	19.0	68.8	60	16.3	46.3
70-74	181	14.7	76.8	126	14.6	83.4	55	15.0	61.3
75-79	116	9.4	86.2	82	9.5	92.9	34	9.3	70.6
80-84	73	5.9	92.2	38	4.4	97.3	35	9.5	80.1
85+	96	7.8	100.0	23	2.7	100.0	73	19.9	100.0
All ages	1229	100.0		862	100.0		367	100.0	



Table 13

Age-specific mortality (cancer-related) and proportion of all cancers  
for period 2007-2016  
(incl. multiple malignancies)

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								
5- 9								
10-14								
15-19								
20-24	1	1	0.1	0.25	0.1	0.50	1.8	3.0
25-29	1	1	0.1	0.14	0.1	0.25	1.4	1.4
30-34	1	1	0.1	0.13	0.1	0.08	1.0	0.8
35-39	2	3	0.1	0.18	0.2	0.75	1.0	1.1
40-44	15	6	0.8	0.32	0.3	0.29	3.0	0.9
45-49	50	9	2.5	0.43	0.5	0.21	4.4	0.7
50-54	88	17	5.1	0.48	1.0	0.30	4.3	0.9
55-59	131	25	9.3	0.66	1.7	0.34	3.9	0.9
60-64	140	47	11.4	0.69	3.5	0.53	2.8	1.3
65-69	164	60	13.8	0.82	4.6	0.65	2.3	1.1
70-74	126	55	11.4	0.88	4.3	0.60	1.4	0.8
75-79	82	34	10.3	0.96	3.4	0.64	0.9	0.5
80-84	38	35	8.3	1.03	4.9	0.69	0.5	0.5
85+	23	73	7.5	0.85	9.9	1.20	0.4	0.8
All ages	862	367					1.6	0.8
Mortality								
Raw			3.8	0.68	1.6	0.56		
WS			2.1	0.64	0.7	0.47		
ES			3.0	0.66	1.0	0.49		
BRD-S			3.5	0.68	1.2	0.52		
PYLL-70								
per 100,000			31.6		8.5			
ES			27.2		7.2			
AYLL-70			10.7		10.0			

Table 14a

Further malignancies in deaths in period 1998–2016  
MALES

Diagnosis	Total n	Total %↓	Pre n	Pre ←%	Syn- chron ±30d n	Syn- chron ±30d ←%	Post n	Post ←%
C03–C06 Oral cavity	63	7.5			3	4.8	60	95.2
C09–C10 Oropharynx	58	6.9			13	22.4	45	77.6
C12–C13 Hypopharynx	64	7.6	20	31.3	9	14.1	35	54.7
C15 Oesophagus	75	8.9	10	13.3	10	13.3	55	73.3
C16 Stomach	15	1.8	2	13.3			13	86.7
C18 Colon	27	3.2	7	25.9	2	7.4	18	66.7
C19–C20 Rectum	34	4.0	6	17.6	2	5.9	26	76.5
C22 Liver	28	3.3	5	17.9	2	7.1	21	75.0
C25 Pancreas	10	1.2	1	10.0			9	90.0
C30–C31 Sinuses	9	1.1	3	33.3	1	11.1	5	55.6
C32 Larynx	53	6.3	26	49.1	9	17.0	18	34.0
C33–C34 Lung	189	22.4	18	9.5	17	9.0	154	81.5
C43 Malign. melanoma	14	1.7	6	42.9	1	7.1	7	50.0
C44 Skin others	45	5.3	15	33.3	4	8.9	26	57.8
C61 Prostate	44	5.2	24	54.5	2	4.5	18	40.9
C64 Kidney	14	1.7	4	28.6	2	14.3	8	57.1
C67 Bladder	24	2.8	12	50.0	1	4.2	11	45.8
C76–C79 CUP	15	1.8	7	46.7			8	53.3
C82–C85 NHL	15	1.8	8	53.3	2	13.3	5	33.3
Others, specified	48	5.7	23	47.9	3	6.3	22	45.8
All further malignancies	844	100.0	197	23.3	83	9.8	564	66.8

Further malignancies with number of cases 1 to 6 are pooled in category “Others, specified”.

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 further malignancy.

Table 14b

Further malignancies in deaths in period 1998-2016  
FEMALES

Diagnosis	Total n	Total %↓	Pre n	Pre ←%	Syn- chron ±30d n	Syn- chron ±30d ←%	Post n	Post ←%
C03-C06 Oral cavity	25	8.4			2	8.0	23	92.0
C09-C10 Oropharynx	23	7.8			4	17.4	19	82.6
C12-C13 Hypopharynx	9	3.0			1	11.1	8	88.9
C14 ENT cancer	3	1.0			1	33.3	2	66.7
C15 Oesophagus	18	6.1					18	100.0
C16 Stomach	6	2.0	1	16.7	1	16.7	4	66.7
C18 Colon	15	5.1	8	53.3			7	46.7
C21 Anus/canal	3	1.0					3	100.0
C22 Liver	5	1.7			1	20.0	4	80.0
C23-C24 Bile	3	1.0					3	100.0
C25 Pancreas	4	1.4	1	25.0			3	75.0
C30-C31 Sinuses	6	2.0	2	33.3	1	16.7	3	50.0
C32 Larynx	8	2.7	3	37.5			5	62.5
C33-C34 Lung	54	18.2	2	3.7	3	5.6	49	90.7
C43 Malign. melanoma	6	2.0	1	16.7	1	16.7	4	66.7
C44 Skin others	14	4.7	4	28.6	2	14.3	8	57.1
C50 Breast	41	13.9	26	63.4			15	36.6
C53 Cervix uteri	11	3.7	9	81.8			2	18.2
C54 Corpus uteri	5	1.7	4	80.0			1	20.0
C56 Ovary	7	2.4	4	57.1			3	42.9
C67 Bladder	4	1.4	1	25.0			3	75.0
C76-C79 CUP	3	1.0	1	33.3			2	66.7
C82-C85 NHL	5	1.7	1	20.0	1	20.0	3	60.0
C90 Mult. myeloma	3	1.0	1	33.3			2	66.7
Others, specified	15	5.1	5	33.3			10	66.7
All further malignancies	296	100.0	74	25.0	18	6.1	204	68.9

Further malignancies with number of cases 1 to 2 are pooled in category "Others, specified".

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 further malignancy.

Table 15

Age-specific mortality (cancer-related) and proportion of all cancers  
for period 2007-2016  
(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								
5- 9								
10-14								
15-19								
20-24	1	1	0.1	0.33	0.1	0.50	2.0	3.2
25-29	1	1	0.1	0.14	0.1	0.25	1.5	1.5
30-34	1	1	0.1	0.13	0.1	0.08	1.0	0.9
35-39	2	3	0.1	0.20	0.2	0.75	1.1	1.2
40-44	13	6	0.7	0.30	0.3	0.29	2.8	1.0
45-49	44	7	2.2	0.43	0.4	0.19	4.2	0.6
50-54	71	13	4.1	0.49	0.8	0.27	3.9	0.8
55-59	102	22	7.2	0.67	1.5	0.39	3.5	0.9
60-64	108	37	8.8	0.72	2.8	0.51	2.6	1.2
65-69	130	46	11.0	0.85	3.5	0.64	2.2	1.1
70-74	96	47	8.7	0.96	3.7	0.66	1.3	0.9
75-79	62	30	7.8	1.09	3.0	0.67	0.9	0.6
80-84	25	28	5.4	1.14	4.0	0.70	0.5	0.5
85+	18	61	5.9	1.00	8.3	1.15	0.4	0.8
All ages	674	303					1.6	0.8
Mortality								
Raw			2.9	0.69	1.3	0.56		
WS			1.7	0.64	0.5	0.47		
ES			2.4	0.66	0.8	0.49		
BRD-S			2.7	0.69	1.0	0.52		
PYLL-70								
per 100,000			25.7		7.2			
ES			22.1		6.1			
AYLL-70			11.0		10.5			

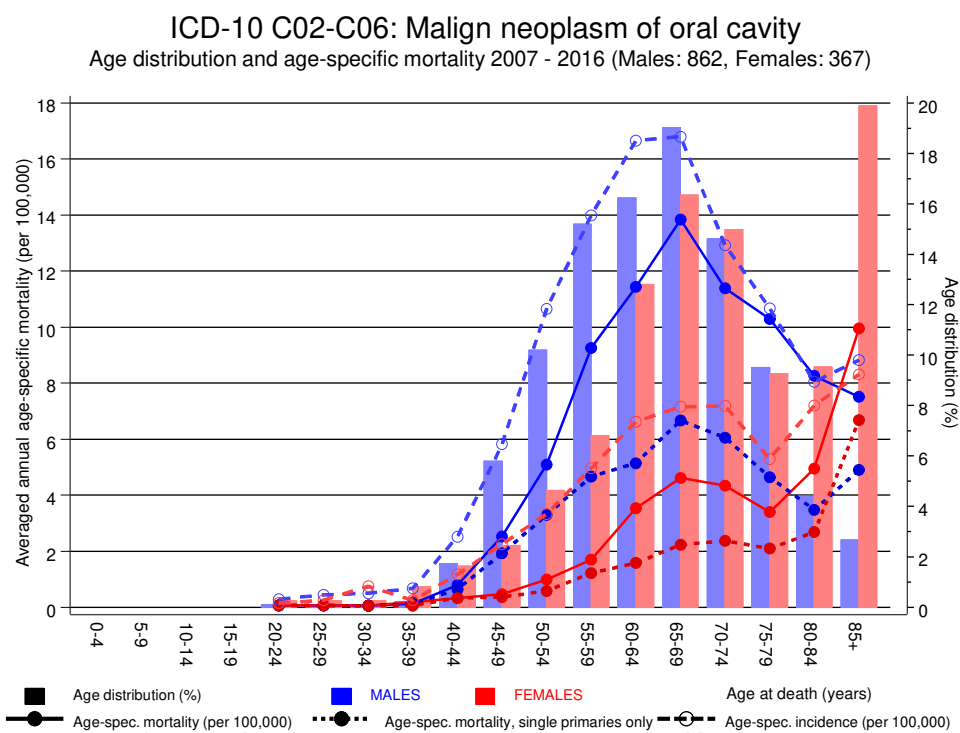
\* See corresponding tables with multiple malignancies.

Table 16

Age-specific mortality (cancer-related) and proportion of all cancers  
for period 2007-2016  
(**Single 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								
5- 9								
10-14								
15-19								
20-24	1	1	0.1	0.33	0.1	0.50	2.0	3.2
25-29	1	1	0.1	0.14	0.1	0.25	1.5	1.5
30-34	1	1	0.1	0.13	0.1	0.10	1.0	1.0
35-39	2	1	0.1	0.20	0.1	0.25	1.1	0.4
40-44	12	6	0.6	0.31	0.3	0.30	2.6	1.0
45-49	38	7	1.9	0.41	0.4	0.21	3.7	0.6
50-54	57	10	3.3	0.44	0.6	0.24	3.2	0.6
55-59	66	18	4.7	0.51	1.2	0.37	2.3	0.8
60-64	63	21	5.1	0.48	1.6	0.31	1.5	0.7
65-69	79	29	6.7	0.63	2.2	0.48	1.4	0.7
70-74	67	30	6.1	0.80	2.4	0.48	1.0	0.6
75-79	37	21	4.6	0.69	2.1	0.57	0.6	0.4
80-84	16	19	3.5	0.80	2.7	0.53	0.3	0.4
85+	15	49	4.9	0.94	6.7	1.00	0.3	0.7
All ages	455	214					1.2	0.6
Mortality								
Raw			2.0	0.53	0.9	0.45		
WS			1.1	0.50	0.4	0.37		
ES			1.6	0.51	0.6	0.39		
BRD-S			1.8	0.53	0.7	0.41		
PYLL-70								
per 100,000			19.2		5.6			
ES			16.4		4.7			
AYLL-70			12.1		11.7			

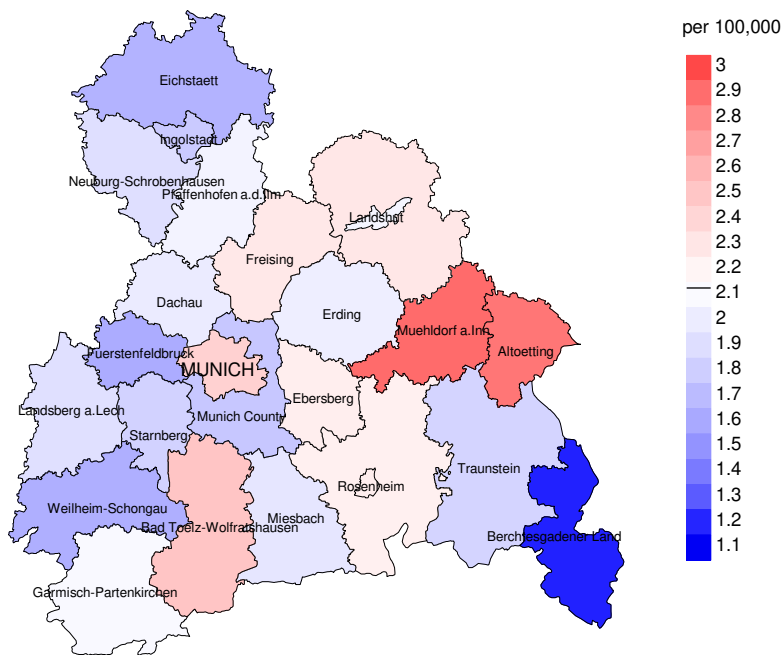
\* See corresponding tables with multiple malignancies.



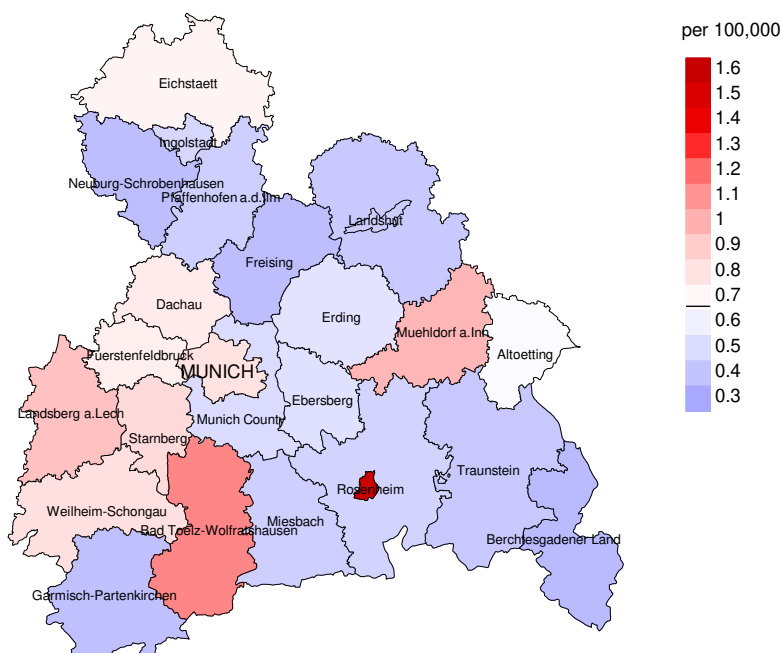
**Figure 17.** Distribution of age at death (bars; males: mean=60.1 yrs, median=59.5 yrs; females: mean=67.2 yrs, median=67.7 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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

Average mortality (world standard population) 2007 - 2016: Males



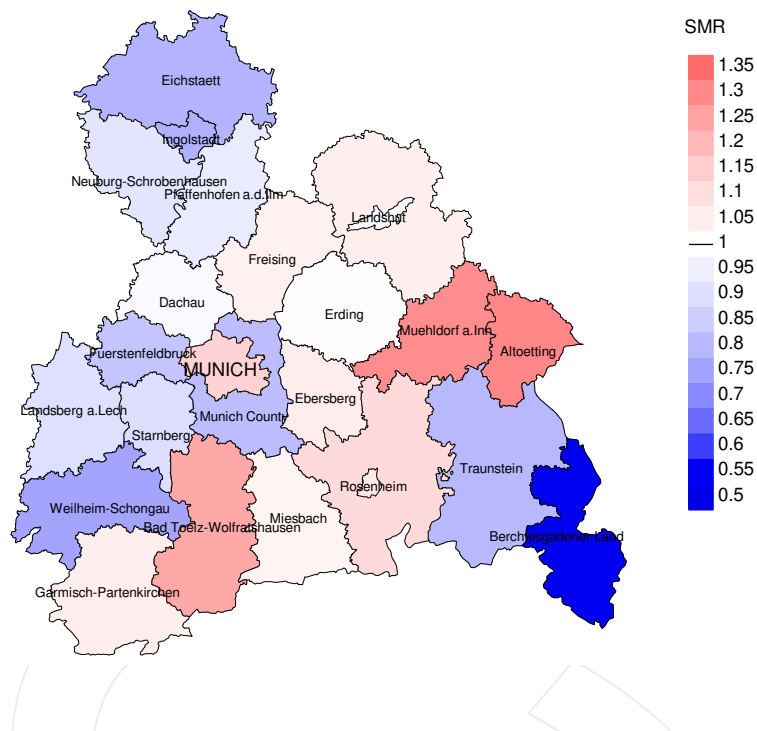
Average mortality (world standard population) 2007 - 2016: Females



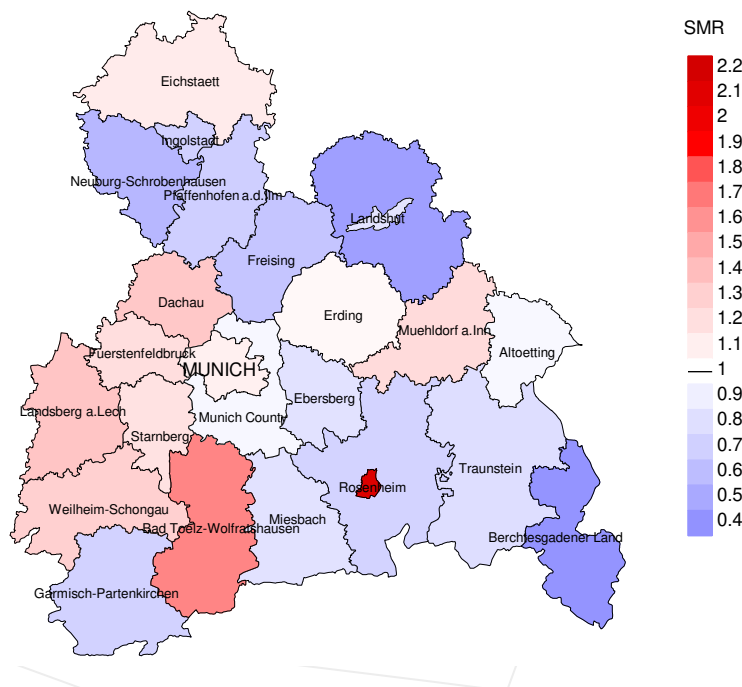
**Figure 18a.** Map of cancer mortality (world standard population) by county averaged for period 2007 to 2016. According to their individual mortality rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 2.1/100,000 WS N=862, females 0.7/100,000 WS N=367).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 66,416 female residents (averaged) in the period from 2007 to 2016 a total of 8 women died from oral cavity cancer. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 0.5/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.1 and 1.6/100,000.

Standardized mortality ratio (SMR) 2007 - 2016: Males



Standardized mortality ratio (SMR) 2007 - 2016: Females



**Figure 18b.** Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2016. According to their individual SMR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=862, females N=367).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 66,416 female residents (averaged) in the period from 2007 to 2016 a total of 8 women died from oral cavity cancer. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 0.81. Though, the value of this parameter may vary with an underlying probability of 99% between 0.26 and 1.89, 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**

MCR	Munich Cancer Registry (Tumorregister München)
GEKID	Association of Population-based Cancer Registries in Germany (Gesellschaft der epidemiologischen Krebsregister in Deutschland e.V.)
SEER	Surveillance, Epidemiology, and End Results (USA)
DCO	Death certificate only
BRD-S	German standard population
ES	European standard population (old)
WS	World standard population
SIR	Standardized incidence ratio
CI	Confidence interval
EAR	Excess absolute risk = excess cancer cases (O - E) per 10,000 person-years
PYLL-70	Potential years of life lost prior to age 70 given a person dies before that age
AYLL-70	Average years of life lost prior to age 70 given a person dies before that age
SMR	Standardized mortality ratio
MI-index	Ratio between mortality and incidence
FRG	Federal Republic of Germany

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