

# Munich Cancer Registry



- ▶ Survival
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## ICD-10 C01, C05, C09-10: Oropharynx cancer

### Incidence and Mortality

Year of diagnosis	1998-2016
Patients	3,260
Diseases	3,291
Creation date	08/21/2018
Export date	08/09/2018
Population	4.81 m




Munich Cancer Registry  
Cancer Registry Bavaria - Upper Bavaria Regional Center  
at Klinikum Grosshadern/IBE  
Marchioninstr. 15  
Munich, 81377  
Germany

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

<https://www.tumorregister-muenchen.de/en/facts/base/bC0910E-ICD-10-C01-C05-C09-10-Oropharynx-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.

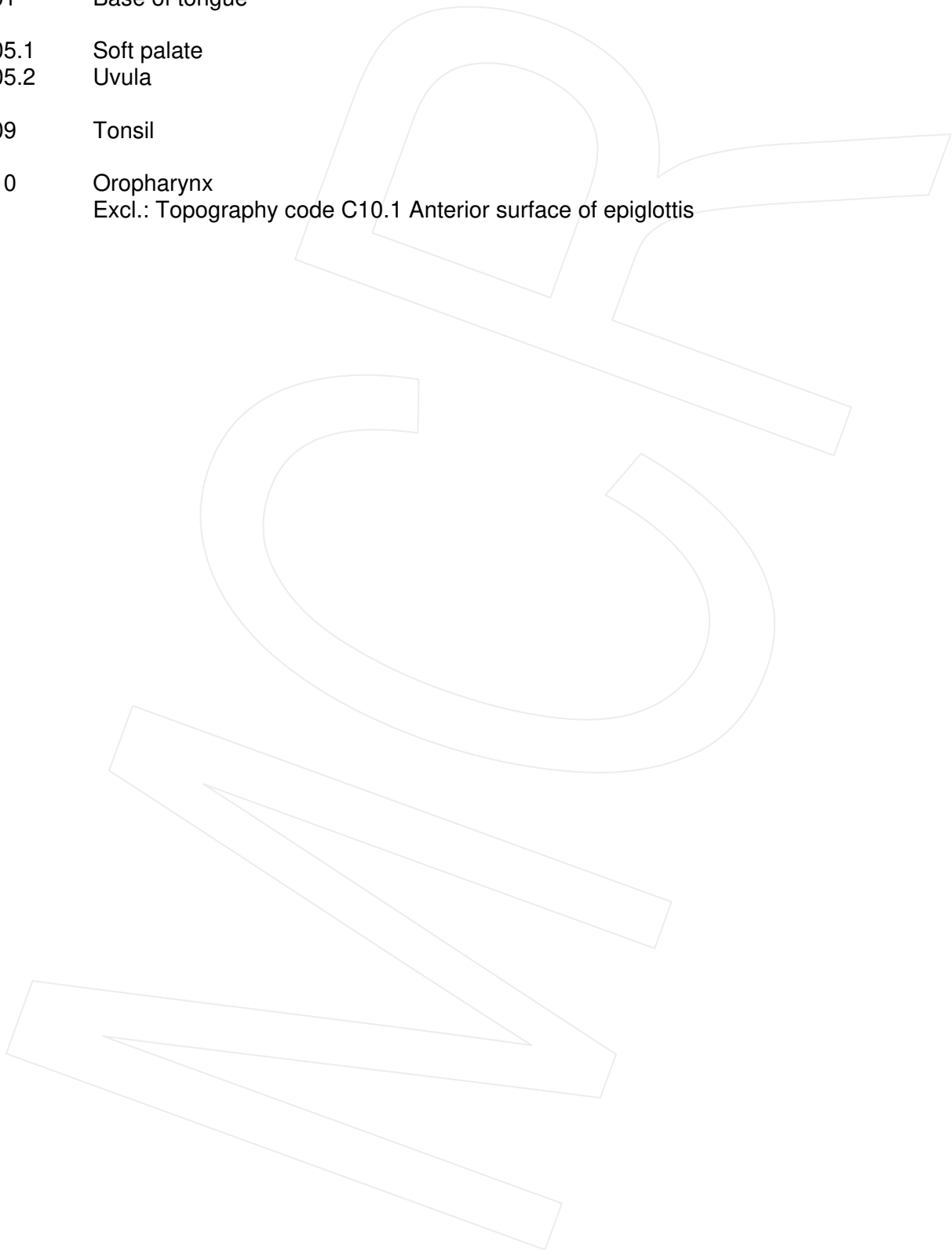
<sup>###</sup> DCO (death certificate only) identifies a cancer case that first becomes available to the MCR through the death certificate.

### **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
C01	Base of tongue
C05.1	Soft palate
C05.2	Uvula
C09	Tonsil
C10	Oropharynx Excl.: Topography code C10.1 Anterior surface of epiglottis



## 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	107	3	2.8	9.3	14.9	88.8	100.0
1999	123	2	1.6	9.1	14.8	82.9	98.4
2000	96	1	1.0	10.4	14.7	82.3	99.0
2001	100	5	5.0	11.5	14.3	82.0	96.0
2002	166	9	5.4	13.0	13.9	77.1	97.6 #
2003	196	8	4.1	13.7	13.1	78.6	98.0
2004	182	7	3.8	13.4	12.3	73.6	97.3
2005	201	8	4.0	14.1	12.1	67.2	95.0
2006	185	2	1.1	14.4	11.4	67.6	93.5
2007	202	12	5.9	13.8	11.3	62.9	84.7 #
2008	225	5	2.2	14.2	10.4	65.8	82.2
2009	219	2	0.9	15.0	9.6	61.2	82.2
2010	222	4	1.8	15.1	8.5	53.6	76.1
2011	230	6	2.6	15.6	7.9	51.7	81.7
2012	218	8	3.7	15.9	7.2	48.6	78.0
2013	221	5	2.3	15.8	7.0	47.5	76.0
2014	198	6	3.0	16.1	6.6	51.5	87.9
2015	130	5	3.8	16.5	8.1	40.8	96.2
2016	70	5	7.1	16.8	7.5	20.0	64.3 ##
1998-2016	3291	103	3.1	16.8	14.9	62.6	87.8

3,291 cases diagnosed 1998-2016 are related to a total of 3,260 patients. Currently, in 1,031 (31.6 %) of these 3,260 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 792 / 177 / 62 (24.3 % / 5.4 % / 1.9 %) 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 198 cases has been diagnosed, of which 16.1 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 6.6 % 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	85	79.4	2	2.4	10.6	15.0	92.9	100.0
1999	99	80.5	1	1.0	8.7	14.7	84.8	98.0
2000	68	70.8	1	1.5	9.9	14.5	82.4	98.5
2001	77	77.0	3	3.9	10.6	14.3	81.8	96.1
2002	131	78.9	9	6.9	13.0	13.8	80.9	97.7 #
2003	146	74.5	5	3.4	13.7	13.1	77.4	98.6
2004	147	80.8	6	4.1	13.7	12.4	71.4	97.3
2005	155	77.1	7	4.5	14.0	12.3	68.4	96.1
2006	136	73.5	2	1.5	14.3	11.6	72.8	94.1
2007	160	79.2	8	5.0	13.9	11.5	66.3	84.4 #
2008	163	72.4	3	1.8	14.4	10.5	65.6	81.6
2009	161	73.5	2	1.2	15.2	9.5	63.4	81.4
2010	170	76.6	4	2.4	15.3	8.5	54.7	77.1
2011	175	76.1	4	2.3	15.6	7.8	53.1	82.3
2012	168	77.1	5	3.0	15.7	6.9	48.2	76.2
2013	171	77.4	4	2.3	15.6	6.7	48.0	76.0
2014	160	80.8	5	3.1	15.8	5.4	52.5	88.1
2015	83	63.8	4	4.8	16.1	8.1	48.2	97.6
2016	49	70.0	3	6.1	16.6	6.4	18.4	69.4 ##
1998-2016	2504	76.1	78	3.1	16.6	15.0	64.2	88.0

2,504 cases diagnosed 1998-2016 are related to a total of 2,482 patients. Currently, in 787 (31.7 %) of these 2,482 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 596 / 142 / 49 (24.0 % / 5.7 % / 2.0 %) 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 160 cases has been diagnosed, of which 15.8 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 5.4 % 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	22	20.6	1	4.5	4.5	14.9	72.7	100.0
1999	24	19.5	1	4.2	10.9	15.0	75.0	100.0
2000	28	29.2			12.2	15.0	82.1	100.0
2001	23	23.0	2	8.7	14.4	14.3	82.6	95.7
2002	35	21.1			12.9	14.2	62.9	97.1 #
2003	50	25.5	3	6.0	13.7	12.9	82.0	96.0
2004	35	19.2	1	2.9	12.4	12.0	82.9	97.1
2005	46	22.9	1	2.2	14.4	11.8	63.0	91.3
2006	49	26.5			14.7	11.0	53.1	91.8
2007	42	20.8	4	9.5	13.6	10.6	50.0	85.7 #
2008	62	27.6	2	3.2	13.5	10.4	66.1	83.9
2009	58	26.5			14.6	9.9	55.2	84.5
2010	52	23.4			14.4	8.4	50.0	73.1
2011	55	23.9	2	3.6	15.7	8.0	47.3	80.0
2012	50	22.9	3	6.0	16.5	8.1	50.0	84.0
2013	50	22.6	1	2.0	16.6	8.1	46.0	76.0
2014	38	19.2	1	2.6	17.1	10.0	47.4	86.8
2015	47	36.2	1	2.1	17.5	8.1	27.7	93.6
2016	21	30.0	2	9.5	17.5	10.0	23.8	52.4 ##
1998-2016	787	23.9	25	3.2	17.5	14.9	57.6	87.2

787 cases diagnosed 1998-2016 are related to a total of 778 patients. Currently, in 244 (31.4 %) of these 778 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 196 / 35 / 13 (25.2 % / 4.5 % / 1.7 %) 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 38 cases has been diagnosed, of which 17.1 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 10.0 % 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	85	22	7.7	1.9	5.4	1.1	7.0	1.6	7.5	1.7
1999	99	24	8.8	2.0	5.8	1.2	7.9	1.6	8.4	1.9
2000	68	28	6.0	2.3	3.9	1.5	5.4	2.0	6.0	2.2
2001	77	23	6.6	1.9	4.5	1.1	6.2	1.5	6.7	1.7
2002	131	35	7.0	1.8	4.6	1.1	6.3	1.5	6.7	1.7
2003	146	50	7.8	2.5	5.0	1.5	7.0	2.1	7.6	2.3
2004	147	35	7.8	1.8	5.0	1.0	6.8	1.4	7.5	1.6
2005	155	46	8.2	2.3	5.3	1.4	7.2	1.9	7.7	2.1
2006	136	49	7.1	2.4	4.5	1.7	6.2	2.1	6.9	2.3
2007	160	42	7.2	1.8	4.5	1.1	6.2	1.5	6.9	1.6
2008	163	62	7.3	2.7	4.5	1.5	6.3	2.0	7.1	2.3
2009	161	58	7.2	2.5	4.5	1.4	6.1	2.0	6.9	2.2
2010	170	52	7.5	2.2	4.5	1.3	6.2	1.8	7.0	2.0
2011	175	55	7.8	2.4	4.6	1.3	6.4	1.8	7.1	2.0
2012	168	50	7.4	2.1	4.4	1.2	6.1	1.6	6.8	1.8
2013	171	50	7.4	2.1	4.4	1.2	6.1	1.7	6.8	1.8
2014	160	38	6.9	1.6	4.1	0.8	5.6	1.2	6.2	1.3
2015	83	47	3.5	1.9	1.9	1.1	2.7	1.5	3.2	1.6
2016	49	21	2.0	0.9	1.2	0.4	1.6	0.6	1.9	0.7
1998-2016	2504	787	6.8	2.1	4.2	1.2	5.8	1.6	6.4	1.8

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.				Median				
		Mean	dev.	Min.	Max.	10%	25%	50%	75%	90%
1998	107	56.5	11.3	0.9	83.1	44.9	50.6	56.0	62.6	71.0
1999	123	58.5	10.3	37.1	91.7	47.1	51.3	57.7	64.0	72.6
2000	96	59.7	10.6	35.6	89.6	47.6	52.0	59.0	66.8	74.1
2001	100	59.3	11.0	28.7	92.5	48.3	51.7	57.6	65.0	74.6
2002	166	58.8	9.8	36.7	96.8	47.3	52.9	58.3	62.9	72.1
2003	196	60.7	9.6	38.3	87.5	49.9	54.3	59.4	65.9	75.0
2004	182	61.0	10.0	38.3	85.5	48.2	54.7	60.5	67.0	75.4
2005	201	60.4	10.4	4.1	103	49.9	54.0	60.6	65.4	71.6
2006	185	59.9	11.0	19.0	90.3	46.3	51.8	59.4	66.8	74.7
2007	202	60.9	11.0	35.2	91.6	47.6	52.9	60.3	68.3	74.8
2008	225	63.3	9.9	38.3	91.8	50.1	56.9	62.4	69.1	76.3
2009	219	62.9	11.1	26.7	95.5	49.8	55.5	61.9	70.0	77.5
2010	222	62.5	9.7	37.1	92.1	49.5	55.2	62.4	69.1	75.0
2011	230	63.1	10.3	40.0	93.8	49.9	55.4	62.7	70.5	76.0
2012	218	62.3	9.9	39.8	91.1	49.4	54.7	61.7	69.5	76.1
2013	221	62.8	9.8	33.2	92.9	51.2	55.3	62.1	68.6	75.9
2014	198	62.8	10.0	40.2	93.5	49.8	55.9	61.5	70.4	76.0
2015	130	65.2	11.0	28.5	93.2	52.0	57.5	64.2	72.2	80.6
2016	70	66.5	9.1	47.8	91.5	56.0	60.6	65.3	72.9	77.2
1998-2016	3291	61.6	10.5	0.9	103	49.1	54.3	60.9	68.1	75.6

Table 3a

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

Year of diagnosis	Cases n	Std.				Median				
		Mean	dev.	Min.	Max.	10%	25%	50%	75%	90%
1998	85	55.9	11.1	0.9	81.1	44.4	49.8	56.0	62.3	70.7
1999	99	57.1	9.2	37.1	85.7	46.4	50.9	56.5	63.0	68.2
2000	68	60.0	10.7	35.6	89.6	48.3	52.3	59.1	66.8	74.1
2001	77	57.8	9.7	28.7	85.1	47.0	51.7	57.2	63.6	71.2
2002	131	58.5	9.2	36.7	96.8	47.4	52.9	58.3	62.9	70.0
2003	146	59.8	9.2	38.3	87.5	48.1	53.8	59.2	65.5	73.2
2004	147	60.4	9.8	38.3	85.5	47.9	54.4	60.4	66.2	73.8
2005	155	59.9	9.9	4.1	87.1	49.4	54.0	60.2	65.3	70.7
2006	136	60.8	10.2	38.7	86.7	47.5	52.8	59.6	67.0	74.7
2007	160	61.0	10.7	37.1	91.6	47.7	53.1	61.0	68.5	74.7
2008	163	62.8	9.6	38.3	87.0	50.1	56.4	62.1	68.8	76.3
2009	161	62.4	10.4	26.7	90.7	50.1	56.1	62.1	68.6	75.7
2010	170	62.7	9.9	38.0	92.1	49.3	55.3	62.4	69.2	75.0
2011	175	62.9	10.2	40.0	89.2	49.8	55.0	62.6	70.3	76.3
2012	168	61.6	9.6	39.8	87.9	49.3	54.3	61.4	67.9	75.8
2013	171	63.1	9.6	33.2	92.9	52.2	56.1	62.2	68.4	75.0
2014	160	62.1	10.0	40.2	93.5	49.1	55.4	60.8	69.7	75.3
2015	83	66.2	11.6	28.5	93.2	51.7	57.6	65.6	74.9	81.2
2016	49	65.1	8.0	47.8	78.9	53.3	58.9	64.5	72.4	76.4
1998-2016	2504	61.2	10.1	0.9	96.8	48.8	54.3	60.7	67.7	74.7

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		
				Min.	Max.	10%	25%	50%	75%	90%
1998	22	59.0	11.6	31.1	83.1	50.8	52.7	56.6	66.0	77.8
1999	24	64.2	12.4	41.9	91.7	48.7	54.7	65.5	73.9	77.9
2000	28	59.0	10.6	38.5	79.7	45.2	51.3	58.8	66.5	74.9
2001	23	64.0	13.7	41.3	92.5	49.6	50.6	63.0	74.5	83.0
2002	35	59.8	12.0	37.3	81.7	46.8	50.3	57.7	68.0	78.9
2003	50	63.3	10.3	43.7	84.2	52.7	55.8	61.3	71.7	79.0
2004	35	63.5	10.4	44.7	82.5	50.9	55.8	60.9	74.3	77.8
2005	46	62.4	11.9	44.7	103	49.9	53.6	61.0	66.5	79.3
2006	49	57.5	12.9	19.0	90.3	45.4	49.5	57.0	64.7	72.5
2007	42	60.4	12.2	35.2	89.4	47.5	51.4	57.9	68.1	76.0
2008	62	64.7	10.5	45.6	91.8	51.5	57.5	65.0	69.6	80.7
2009	58	64.0	13.0	41.0	95.5	49.6	55.1	60.9	72.6	84.4
2010	52	61.8	9.3	37.1	85.1	49.5	54.9	62.3	68.4	72.6
2011	55	64.0	10.6	41.0	93.8	53.4	56.5	63.9	71.4	75.6
2012	50	64.9	10.6	44.0	91.1	52.1	56.3	64.7	72.3	78.7
2013	50	61.7	10.7	43.0	85.7	50.1	53.5	60.2	69.5	77.8
2014	38	66.0	9.8	48.9	87.4	53.1	59.1	64.6	72.8	79.9
2015	47	63.6	9.7	46.1	89.4	53.3	56.8	63.4	67.7	74.6
2016	21	69.6	10.9	55.2	91.5	57.2	64.1	67.0	74.5	86.7
1998-2016	787	62.8	11.3	19.0	103	49.6	54.7	61.5	69.7	78.4

Table 4

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

Age at diagnosis Years	Cases n	Males			Females				
		%	Cum.%	n	%	Cum.%	n	%	Cum.%
0-4									
5-9									
10-14									
15-19									
20-24									
25-29	2	0.1	0.1	2	0.1	0.1			0.0
30-34	1	0.1	0.2	1	0.1	0.2			0.0
35-39	10	0.5	0.7	8	0.5	0.8	2	0.4	0.4
40-44	36	1.9	2.5	26	1.8	2.5	10	2.1	2.5
45-49	143	7.4	9.9	114	7.8	10.3	29	6.1	8.6
50-54	260	13.4	23.4	192	13.2	23.5	68	14.3	22.9
55-59	339	17.5	40.9	256	17.5	41.0	83	17.5	40.4
60-64	368	19.0	59.9	288	19.7	60.8	80	16.8	57.3
65-69	312	16.1	76.0	231	15.8	76.6	81	17.1	74.3
70-74	222	11.5	87.5	169	11.6	88.2	53	11.2	85.5
75-79	136	7.0	94.5	106	7.3	95.4	30	6.3	91.8
80-84	60	3.1	97.6	44	3.0	98.4	16	3.4	95.2
85+	46	2.4	100.0	23	1.6	100.0	23	4.8	100.0
All ages	1935	100.0		1460	100.0		475	100.0	

Table 5

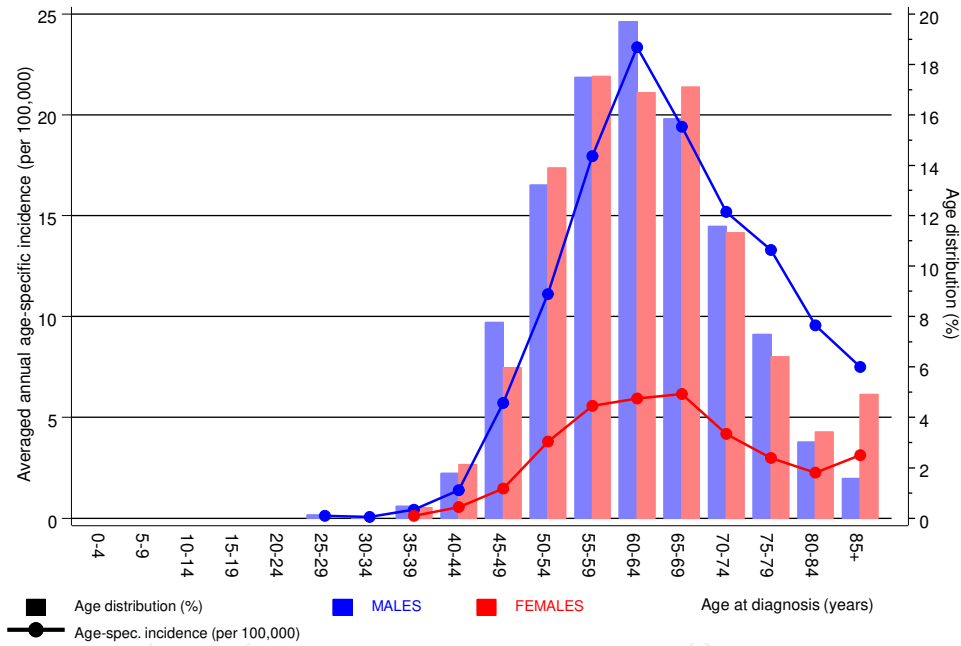
Age-specific incidence, DCO rate and proportion of all cancers  
for period 2007-2016

Age at diagnosis Years	Males n	Females n	Males Age- spec. incid.	Females Age- spec. incid.	Males DCO rate n=42 %	Females DCO rate n=16 %	Males	Females
							Prop.all cancers n=113978 %	Prop.all cancers n=112253 %
0- 4								
5- 9								
10-14								
15-19								
20-24								
25-29	2		0.1				0.3	
30-34	1		0.1				0.1	
35-39	7	2	0.4	0.1			0.5	0.1
40-44	26	10	1.4	0.6		10.0	1.2	0.2
45-49	113	28	5.7	1.5	0.9		2.9	0.4
50-54	192	65	11.1	3.8	0.5	3.1	3.1	0.7
55-59	254	82	17.9	5.6	2.0		2.8	0.9
60-64	286	79	23.3	5.9	2.1	1.3	2.2	0.7
65-69	230	80	19.4	6.2	3.0		1.2	0.6
70-74	168	53	15.2	4.2	4.2	5.7	0.8	0.4
75-79	106	30	13.3	3.0	6.6		0.6	0.2
80-84	44	16	9.6	2.3	6.8	18.8	0.4	0.1
85+	23	23	7.5	3.1	21.7	26.1	0.3	0.2
All ages	1452	468			2.9	3.4	1.3	0.4
Incidence								
Raw			6.4	2.0				
WS			3.8	1.1				
ES			5.2	1.5				
BRD-S			5.9	1.7				

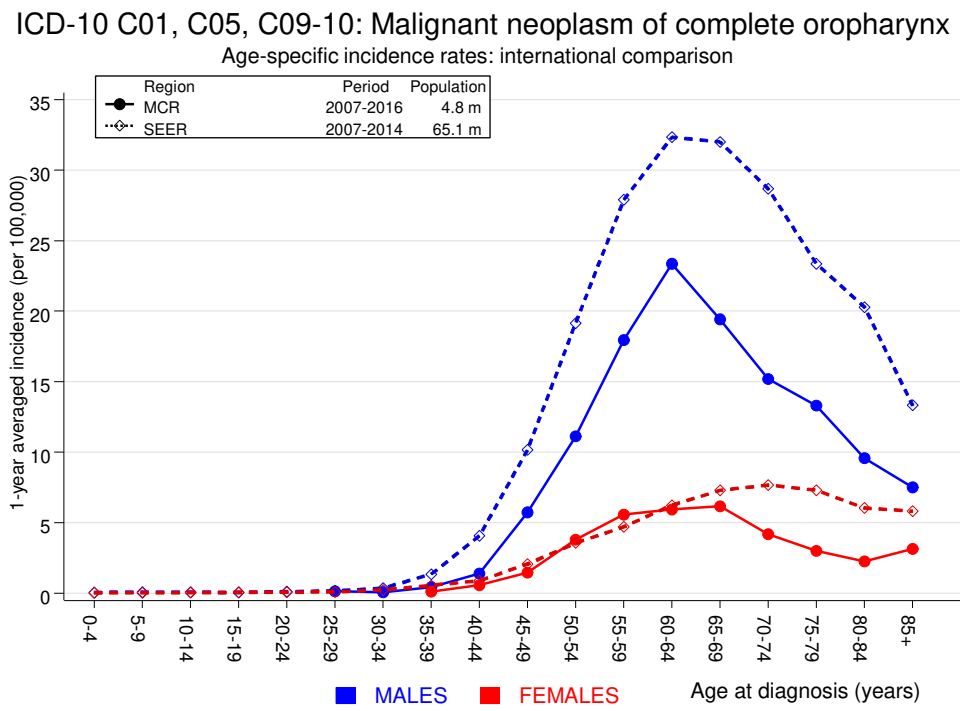
The age-specific incidence characterizes the disease risk in a particular age group. The age distribution depends on the patient population frequency in each age group and reflects the tangible clinical picture of everyday patients care (see following chart).

ICD-10 C01, C05, C09-10: Malignant neoplasm of complete oropharynx

Age distribution and age-specific incidence 2007 - 2016 (Males: 1452, Females: 468)



**Figure 6.** Age distribution (males: mean=62.7 yrs, median=62.0 yrs; females: mean=63.9 yrs, median=63.5 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	47	1.1	41.7	30.6	55.4 #	60.9	4.3
C09–C10 Oropharynx	23	1.5	15.6	9.9	23.4 #	28.6	
C11 Nasopharynx	3	0.1	32.5	6.7	94.9 #	3.9	
C12–C13 Hypopharynx	31	0.8	39.4	26.8	55.9 #	40.1	6.5
C15 Oesophagus	52	2.1	24.8	18.5	32.5 #	66.2	28.8
C16 Stomach	9	3.4	2.7	1.2	5.1 #	7.5	11.1
C18 Colon	21	8.1	2.6	1.6	4.0 #	17.1	4.8
C19–C20 Rectum	5	5.3	0.9	0.3	2.2	-0.4	
C22 Liver	12	2.8	4.3	2.2	7.6 #	12.3	16.7
C25 Pancreas	8	3.4	2.4	1.0	4.7 #	6.2	37.5
C30–C31 Sinuses	2	0.2	10.6	1.3	38.3 #	2.4	
C32 Larynx	41	1.2	34.5	24.8	46.8 #	52.9	43.9
C33–C34 Lung	107	11.5	9.3	7.6	11.2 #	126.8	13.1
C43 Malign. melanoma	8	4.4	1.8	0.8	3.6	4.7	
C46,C49 Soft tissue	2	0.5	3.8	0.5	13.7	2.0	
C61 Prostate	30	26.5	1.1	0.8	1.6	4.7	
C64 Kidney	12	3.5	3.4	1.8	5.9 #	11.2	
C67 Bladder	12	3.6	3.4	1.7	5.9 #	11.2	8.3
C70–C72 CNS cancer	2	1.3	1.5	0.2	5.4	0.9	
C73 Thyroid	4	0.9	4.7	1.3	12.0 #	4.2	
C76–C79 CUP	4	1.5	2.7	0.7	6.8	3.3	
C82–C85 NHL	7	3.6	1.9	0.8	4.0	4.5	
C90 Mult. myeloma	2	1.1	1.8	0.2	6.5	1.2	
C91–C96 Leukaemia	4	1.3	3.0	0.8	7.7	3.5	50.0
Others, specified	9	2.6	3.4	1.6	6.5 #	8.5	22.2
Not observed	0	2.4	0.0	0.0	1.6	-3.1	
All further malignancies	457	94.6	4.8	4.4	5.3 #	481.1	13.8
Patients		2380					
Median age at next malignancy (years)		63.1					
Person-years		7533					
Mean observation time (years)		3.2					
Median observation time (years)		1.7					

# 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

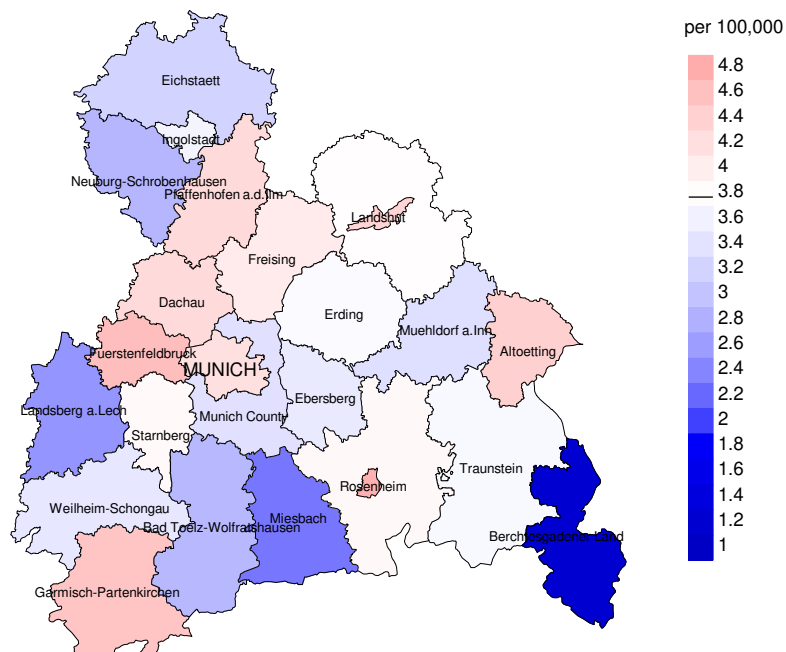
## FEMALES

Diagnosis	Observed n	Expected n	SIR	CI 95%	CI 95%	EAR	DCO %
C03-C06 Oral cavity	12	0.2	69.6	36.0	121.6 #	44.2	
C09-C10 Oropharynx	9	0.1	63.0	28.8	119.5 #	33.1	
C12-C13 Hypopharynx	9	0.0	235.7	107.8	447.5 #	33.5	
C14 ENT cancer	2	0.0	558.5	67.6	2018 #	7.5	50.0
C15 Oesophagus	11	0.2	62.0	30.9	110.9 #	40.5	
C16 Stomach	4	0.8	5.2	1.4	13.3 #	12.1	
C18 Colon	8	2.2	3.7	1.6	7.2 #	21.7	
C19-C20 Rectum	3	1.0	3.0	0.6	8.8	7.5	
C32 Larynx	13	0.1	227.5	121.2	389.1 #	48.4	15.4
C33-C34 Lung	31	2.1	14.8	10.1	21.1 #	108.1	22.6
C50 Breast	9	8.7	1.0	0.5	2.0	1.0	11.1
C53 Cervix uteri	4	0.4	10.3	2.8	26.3 #	13.5	
C54 Corpus uteri	2	1.5	1.3	0.2	4.9	1.9	
C56 Ovary	3	1.1	2.8	0.6	8.3	7.3	33.3
C76-C79 CUP	2	0.4	4.9	0.6	17.7	6.0	
C82-C85 NHL	3	0.9	3.2	0.7	9.4	7.7	
Others, specified	7	3.6	1.9	0.8	4.0	12.6	
Not observed	0	3.0	0.0	0.0	1.2	-11.1	
All further malignancies	132	26.2	5.0	4.2	6.0 #	395.4	9.1
Patients		735					
Median age at next malignancy (years)		63.3					
Person-years		2675					
Mean observation time (years)		3.6					
Median observation time (years)		2.3					

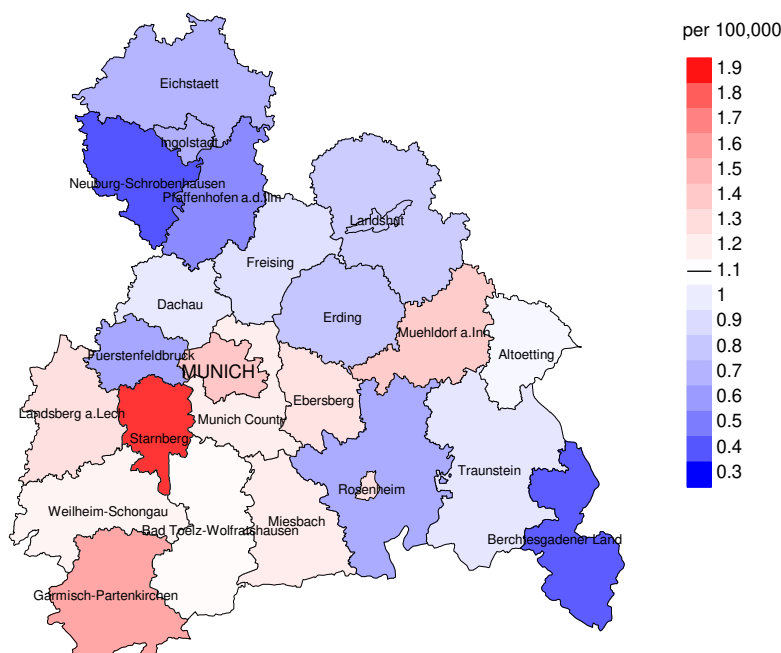
# The occurrence of further malignancy listed is statistically significant.

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

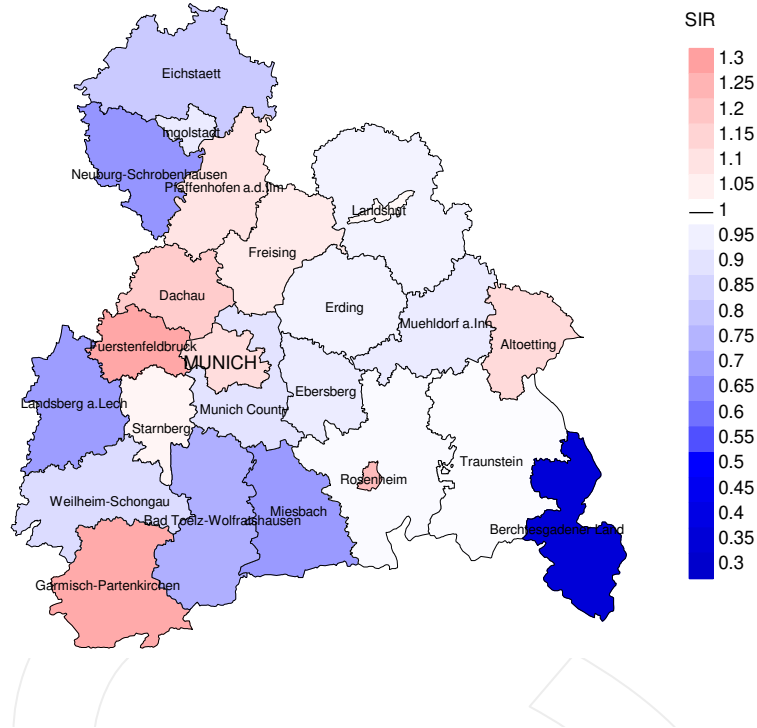


**Figure 8a.** Map of cancer incidence (world standard population, incl. DCO cases) by county averaged for period 2007 to 2016. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 3.8/100,000 WS N=1,452, females 1.1/100,000 WS N=468).

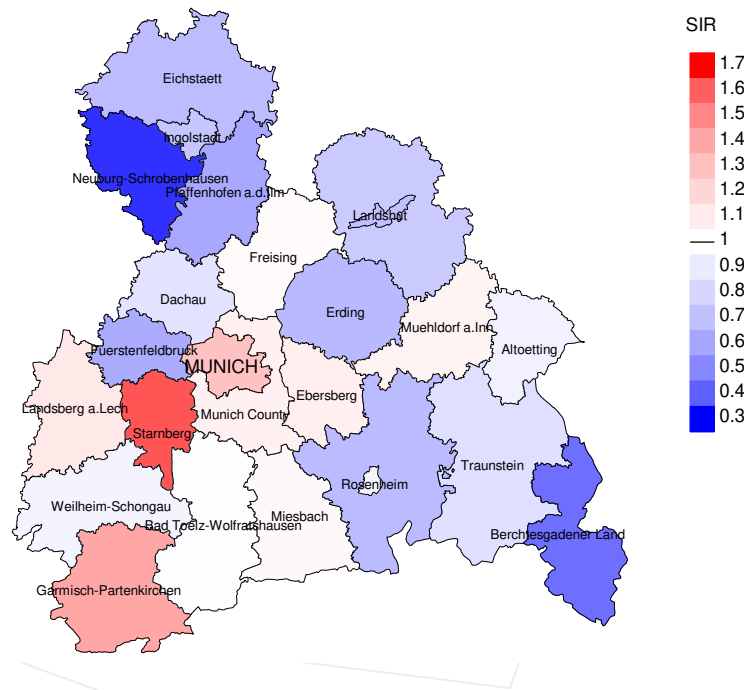
The results should be interpreted with caution! E.g., in county Ebersberg with a population of 66,416 female residents (averaged) in the period from 2007 to 2016 a total of 14 women were identified with newly diagnosed oropharynx cancer. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 1.3/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.5 and 2.6/100,000.



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=1,452, females N=468).

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 14 women were identified with newly diagnosed oropharynx cancer. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 1.08. Though, the value of this parameter may vary with an underlying probability of 99% between 0.48 and 2.07, 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	107	100.0	2.8	95	88.8	95.8
1999	123	98.4	1.6	102	82.9	88.2
2000	96	99.0	1.0	79	82.3	98.7
2001	100	96.0	5.0	82	82.0	96.3
2002	166	97.6	5.4	128	77.1	97.7
2003	196	98.0	4.1	154	78.6	96.8
2004	182	97.3	3.8	134	73.6	99.3
2005	201	95.0	4.0	135	67.2	97.8
2006	185	93.5	1.1	125	67.6	97.6
2007	202	84.7	5.9	127	62.9	97.6
2008	225	82.2	2.2	148	65.8	98.6
2009	219	82.2	0.9	134	61.2	100.0
2010	222	76.1	1.8	119	53.6	99.2
2011	230	81.7	2.6	119	51.7	94.1
2012	218	78.0	3.7	106	48.6	97.2
2013	221	76.0	2.3	105	47.5	97.1
2014	198	87.9	3.0	102	51.5	95.1
2015	130	96.2	3.8	53	40.8	96.2
2016	70	64.3	7.1	14	20.0	92.9
1998-2016	3291	87.8	3.1	2061	62.6	97.0

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	107	78	92.3	13	12.1
1999	123	85	85.9	21	17.1
2000	96	87	94.3	11	11.5
2001	100	76	97.4	20	20.0
2002	166	113	97.3	19	11.4
2003	196	126	95.2	38	19.4
2004	182	129	98.4	24	13.2
2005	201	133	97.0	34	16.9
2006	185	137	97.8	26	14.1
2007	202	149	96.0	30	14.9
2008	225	141	100.0	31	13.8
2009	219	145	99.3	29	13.2
2010	222	154	99.4	28	12.6
2011	230	154	98.7	32	13.9
2012	218	151	98.0	23	10.6
2013	221	181	97.8	32	14.5
2014	198	173	98.8	36	18.2
2015	130	189	99.5	38	29.2
2016	70	111	100.0	13	18.6
1998-2016	3291	2512	97.5	498	15.1

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	78	80.8	19.2	91.7
1999	85	68.2	31.8	89.0
2000	87	79.3	20.7	87.8
2001	76	81.6	18.4	95.9
2002	113	81.4	18.6	89.1
2003	126	77.0	23.0	91.7
2004	129	87.6	12.4	95.3
2005	133	88.0	12.0	94.6
2006	137	83.9	16.1	91.0
2007	149	81.9	18.1	89.5
2008	141	78.0	22.0	85.8
2009	145	84.8	15.2	95.8
2010	154	80.5	19.5	92.2
2011	154	77.3	22.7	86.2
2012	151	80.1	19.9	88.5
2013	181	76.8	23.2	87.6
2014	173	76.9	23.1	88.9
2015	189	81.0	19.0	91.0
2016	111	73.0	27.0	87.4
1998-2016	2512	80.1	19.9	90.3

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	57	60.5	57.9	70.4	58.9
1999	66	61.3	57.8	67.1	57.8
2000	66	61.0	58.0	70.5	58.8
2001	61	60.3	60.3	59.4	60.4
2002	93	60.2	59.6	63.9	59.6
2003	98	60.1	59.9	62.3	59.5
2004	103	61.7	61.7	62.6	61.7
2005	106	61.9	61.9	61.5	61.9
2006	103	65.2	65.2	65.1	65.1
2007	126	64.0	62.1	70.2	63.2
2008	109	66.3	65.6	67.5	65.9
2009	113	62.6	62.5	67.0	62.6
2010	120	64.5	63.9	70.8	63.9
2011	123	67.3	64.0	73.1	65.0
2012	110	68.1	67.6	68.6	67.3
2013	135	66.4	64.9	69.7	65.5
2014	138	68.5	67.4	74.6	68.0
2015	140	66.2	66.2	66.3	66.2
2016	82	73.1	71.4	77.1	71.6
1998-2016	1949	64.2	63.1	69.0	63.6

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	21	71.7	69.5	83.1	72.2
1999	19	58.4	55.9	70.0	55.9
2000	21	56.9	56.5	74.0	57.0
2001	15	66.2	63.4	74.8	63.6
2002	20	67.8	67.8	65.6	71.9
2003	28	61.8	63.0	59.8	64.3
2004	26	66.9	64.8	76.7	64.9
2005	27	63.4	62.1	73.8	61.5
2006	34	66.1	65.6	78.5	65.6
2007	23	69.3	69.3	67.9	68.1
2008	32	66.9	66.9	77.1	66.8
2009	32	66.0	67.2	62.3	66.0
2010	34	66.6	64.9	72.4	64.9
2011	31	68.3	68.1	83.3	68.1
2012	41	71.5	67.8	76.4	67.8
2013	46	70.6	67.9	81.1	68.3
2014	35	72.2	69.3	83.4	71.7
2015	49	67.3	67.3	69.6	67.0
2016	29	70.8	70.5	71.7	70.8
1998-2016	563	67.4	65.9	74.1	66.7

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	47	4.2	0.55	3.0	0.56	3.9	0.55	4.1	0.55
1999	48	4.3	0.48	2.8	0.48	3.9	0.49	4.3	0.51
2000	51	4.5	0.75	2.9	0.74	4.0	0.74	4.6	0.76
2001	51	4.4	0.66	2.8	0.62	3.8	0.62	4.3	0.63
2002	78	4.2	0.60	2.8	0.59	3.8	0.60	4.4	0.65
2003	79	4.2	0.55	2.7	0.54	3.8	0.55	4.1	0.55
2004	91	4.8	0.62	3.0	0.61	4.2	0.62	4.8	0.64
2005	94	5.0	0.61	3.0	0.57	4.2	0.59	4.7	0.61
2006	87	4.5	0.64	2.6	0.59	3.7	0.60	4.3	0.62
2007	103	4.6	0.65	2.8	0.63	4.0	0.64	4.5	0.66
2008	87	3.9	0.53	2.3	0.51	3.2	0.51	3.6	0.51
2009	97	4.3	0.60	2.6	0.58	3.6	0.59	4.1	0.60
2010	99	4.4	0.59	2.5	0.57	3.6	0.58	4.2	0.61
2011	94	4.2	0.54	2.4	0.52	3.4	0.54	4.0	0.56
2012	87	3.8	0.52	2.0	0.45	2.9	0.48	3.5	0.52
2013	104	4.5	0.61	2.4	0.55	3.5	0.58	4.1	0.61
2014	109	4.7	0.69	2.4	0.61	3.5	0.63	4.1	0.67
2015	114	4.8	1.39	2.6	1.38	3.7	1.39	4.4	1.37
2016	58	2.4	1.18	1.1	0.97	1.7	1.04	2.2	1.16
1998-2016	1578	4.3	0.63	2.5	0.60	3.5	0.62	4.1	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	16	1.4	0.73	0.7	0.63	1.0	0.62	1.2	0.74
1999	10	0.8	0.42	0.6	0.47	0.8	0.47	0.8	0.43
2000	18	1.5	0.64	0.9	0.59	1.2	0.60	1.4	0.63
2001	11	0.9	0.48	0.5	0.47	0.7	0.45	0.8	0.46
2002	14	0.7	0.40	0.4	0.35	0.6	0.37	0.7	0.40
2003	18	0.9	0.37	0.5	0.34	0.7	0.34	0.8	0.35
2004	22	1.1	0.63	0.6	0.58	0.8	0.56	1.0	0.60
2005	23	1.2	0.50	0.7	0.50	1.0	0.52	1.1	0.51
2006	28	1.4	0.57	0.7	0.43	1.0	0.47	1.2	0.52
2007	19	0.8	0.46	0.4	0.34	0.5	0.36	0.6	0.40
2008	23	1.0	0.37	0.5	0.37	0.8	0.37	0.8	0.36
2009	27	1.2	0.47	0.6	0.45	0.9	0.45	1.0	0.46
2010	25	1.1	0.50	0.6	0.45	0.8	0.47	0.9	0.49
2011	25	1.1	0.47	0.5	0.40	0.7	0.41	0.8	0.42
2012	34	1.4	0.68	0.7	0.58	1.0	0.60	1.1	0.63
2013	35	1.5	0.70	0.7	0.58	1.0	0.60	1.2	0.69
2014	24	1.0	0.63	0.5	0.55	0.7	0.58	0.7	0.57
2015	39	1.6	0.85	0.8	0.71	1.1	0.74	1.3	0.81
2016	23	0.9	1.10	0.4	0.96	0.6	1.01	0.7	1.07
1998-2016	434	1.1	0.56	0.6	0.49	0.8	0.51	1.0	0.54

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									
25-29									
30-34									
35-39	3	0.2	0.2	3	0.3	0.3			0.0
40-44	9	0.7	1.0	9	0.9	1.3			0.0
45-49	41	3.3	4.3	31	3.3	4.5	10	3.6	3.6
50-54	138	11.3	15.6	111	11.7	16.2	27	9.9	13.5
55-59	199	16.2	31.8	160	16.8	33.0	39	14.2	27.7
60-64	189	15.4	47.2	153	16.1	49.1	36	13.1	40.9
65-69	206	16.8	64.0	160	16.8	65.9	46	16.8	57.7
70-74	188	15.3	79.4	142	14.9	80.8	46	16.8	74.5
75-79	126	10.3	89.6	101	10.6	91.4	25	9.1	83.6
80-84	75	6.1	95.8	56	5.9	97.3	19	6.9	90.5
85+	52	4.2	100.0	26	2.7	100.0	26	9.5	100.0
All ages	1226	100.0		952	100.0		274	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		Females		Males		Females	
	n	n	Age- spec. mortal.	MI-index	Age- spec. mortal.	MI-index	Prop.all cancers %	Prop.all cancers %
0- 4								
5- 9								
10-14								
15-19								
20-24								
25-29								
30-34								
35-39	3		0.2	0.43			1.5	
40-44	9		0.5	0.35			1.8	
45-49	31	10	1.6	0.27	0.5	0.36	2.7	0.8
50-54	111	27	6.4	0.58	1.6	0.42	5.4	1.4
55-59	160	39	11.3	0.63	2.7	0.48	4.7	1.4
60-64	153	36	12.5	0.53	2.7	0.46	3.1	1.0
65-69	160	46	13.5	0.70	3.5	0.58	2.2	0.9
70-74	142	46	12.8	0.85	3.6	0.87	1.5	0.7
75-79	101	25	12.7	0.95	2.5	0.83	1.1	0.4
80-84	56	19	12.2	1.27	2.7	1.19	0.7	0.3
85+	26	26	8.5	1.13	3.5	1.13	0.4	0.3
All ages	952	274					1.8	0.6
Mortality								
Raw			4.2	0.66	1.2	0.59		
WS			2.3	0.61	0.6	0.51		
ES			3.3	0.63	0.8	0.52		
BRD-S			3.9	0.66	0.9	0.55		
PYLL-70								
per 100,000			32.4		7.9			
ES			28.2		6.6			
AYLL-70			10.4		9.9			

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	39	4.9			2	5.1	37	94.9
C09-C10 Oropharynx	72	9.0			19	26.4	53	73.6
C12-C13 Hypopharynx	53	6.6	16	30.2	22	41.5	15	28.3
C15 Oesophagus	86	10.8	17	19.8	15	17.4	54	62.8
C16 Stomach	15	1.9	5	33.3	3	20.0	7	46.7
C18 Colon	26	3.3	7	26.9	2	7.7	17	65.4
C22 Liver	15	1.9			2	13.3	13	86.7
C25 Pancreas	18	2.3	2	11.1			16	88.9
C32 Larynx	70	8.8	26	37.1	16	22.9	28	40.0
C33-C34 Lung	154	19.3	26	16.9	17	11.0	111	72.1
C44 Skin others	47	5.9	10	21.3	9	19.1	28	59.6
C61 Prostate	49	6.1	24	49.0	2	4.1	23	46.9
C64 Kidney	26	3.3	11	42.3	2	7.7	13	50.0
C67 Bladder	21	2.6	7	33.3			14	66.7
C73 Thyroid	8	1.0	4	50.0	1	12.5	3	37.5
C76-C79 CUP	22	2.8	15	68.2	3	13.6	4	18.2
C82-C85 NHL	10	1.3	3	30.0	1	10.0	6	60.0
C91-C96 Leukaemia	8	1.0	4	50.0			4	50.0
Others, specified	59	7.4	28	47.5	4	6.8	27	45.8
All further malignancies	798	100.0	205	25.7	120	15.0	473	59.3

Further malignancies with number of cases 1 to 7 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	10	4.4			1	10.0	9	90.0
C09-C10 Oropharynx	26	11.4			7	26.9	19	73.1
C12-C13 Hypopharynx	8	3.5	1	12.5	3	37.5	4	50.0
C15 Oesophagus	19	8.3	4	21.1	2	10.5	13	68.4
C16 Stomach	4	1.8			2	50.0	2	50.0
C18 Colon	10	4.4	5	50.0	1	10.0	4	40.0
C21 Anus/canal	3	1.3	2	66.7			1	33.3
C30-C31 Sinuses	3	1.3					3	100.0
C32 Larynx	18	7.9	5	27.8	6	33.3	7	38.9
C33-C34 Lung	36	15.8	5	13.9	3	8.3	28	77.8
C44 Skin others	10	4.4	3	30.0			7	70.0
C50 Breast	27	11.8	19	70.4	1	3.7	7	25.9
C53 Cervix uteri	9	3.9	6	66.7			3	33.3
C54 Corpus uteri	4	1.8	4	100.0				
C67 Bladder	3	1.3	2	66.7			1	33.3
C73 Thyroid	4	1.8	3	75.0	1	25.0		
C76-C79 CUP	13	5.7	9	69.2			4	30.8
C82-C85 NHL	3	1.3	1	33.3			2	66.7
Others, specified	18	7.9	5	27.8	2	11.1	11	61.1
All further malignancies	228	100.0	74	32.5	29	12.7	125	54.8

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.	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								
25-29								
30-34								
35-39	1		0.1	0.20			0.5	
40-44	7		0.4	0.33			1.5	
45-49	18	10	0.9	0.19	0.5	0.42	1.7	0.9
50-54	93	22	5.4	0.55	1.3	0.40	5.1	1.3
55-59	125	30	8.8	0.61	2.0	0.48	4.2	1.3
60-64	113	29	9.2	0.53	2.2	0.44	2.7	0.9
65-69	117	35	9.9	0.66	2.7	0.59	2.0	0.8
70-74	112	30	10.1	0.97	2.4	0.79	1.6	0.6
75-79	71	12	8.9	1.00	1.2	0.63	1.1	0.2
80-84	40	12	8.7	1.43	1.7	1.20	0.7	0.2
85+	20	17	6.5	1.25	2.3	0.94	0.4	0.2
All ages	717	197					1.8	0.5
Mortality								
Raw			3.1	0.64	0.8	0.54		
WS			1.7	0.59	0.4	0.48		
ES			2.5	0.61	0.6	0.49		
BRD-S			2.9	0.64	0.7	0.52		
PYLL-70								
per 100,000			24.6		6.5			
ES			21.5		5.4			
AYLL-70			10.5		10.2			

\* See corresponding tables with multiple malignancies.

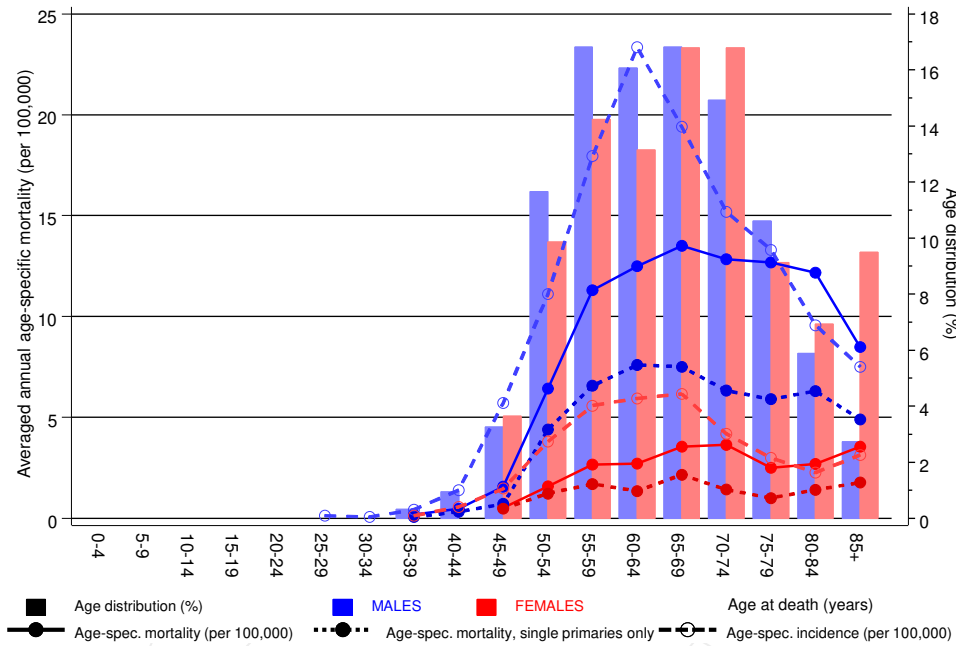
Table 16

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. 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						
25-29						
30-34						
35-39	1		0.1	0.20	0.5	
40-44	6		0.3	0.32	1.3	
45-49	14	9	0.7	0.16	1.4	0.8
50-54	76	21	4.4	0.50	4.3	1.3
55-59	93	25	6.6	0.51	3.2	1.1
60-64	93	18	7.6	0.47	2.3	0.6
65-69	89	28	7.5	0.59	1.6	0.7
70-74	70	18	6.3	0.71	1.0	0.3
75-79	47	10	5.9	0.75	0.7	0.2
80-84	29	10	6.3	1.16	0.6	0.2
85+	15	13	4.9	1.07	0.3	0.2
All ages	533	152			1.4	0.4
Mortality						
Raw			2.3	0.54	0.6	0.47
WS			1.3	0.50	0.3	0.42
ES			1.9	0.52	0.5	0.44
BRD-S			2.2	0.54	0.5	0.45
PYLL-70						
per 100,000			19.4		5.4	
ES			17.0		4.6	
AYLL-70			10.6		10.8	

\* See corresponding tables with multiple malignancies.

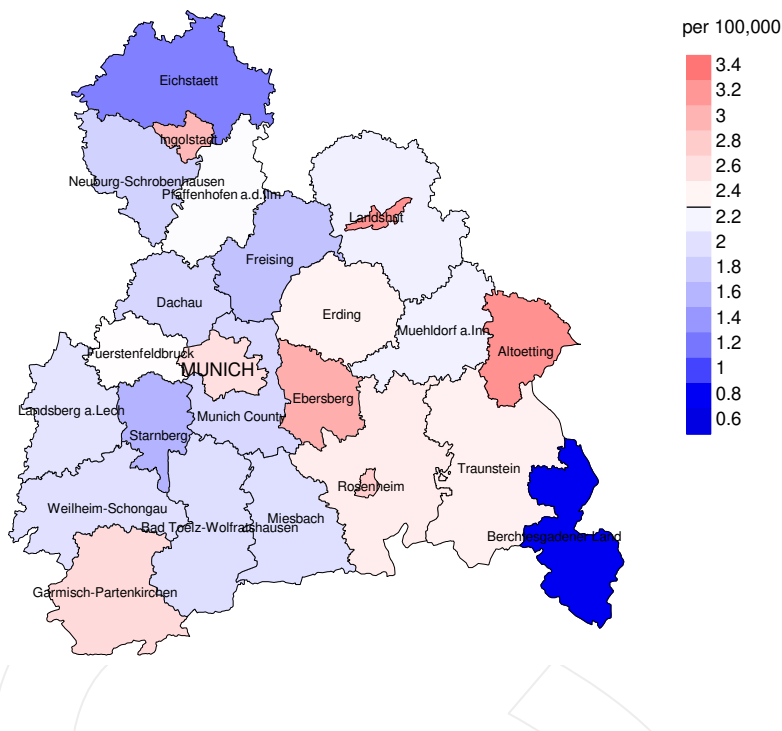
ICD-10 C01, C05, C09-10: Malignant neoplasm of complete oropharynx  
 Age distribution and age-specific mortality 2007 - 2016 (Males: 952, Females: 274)



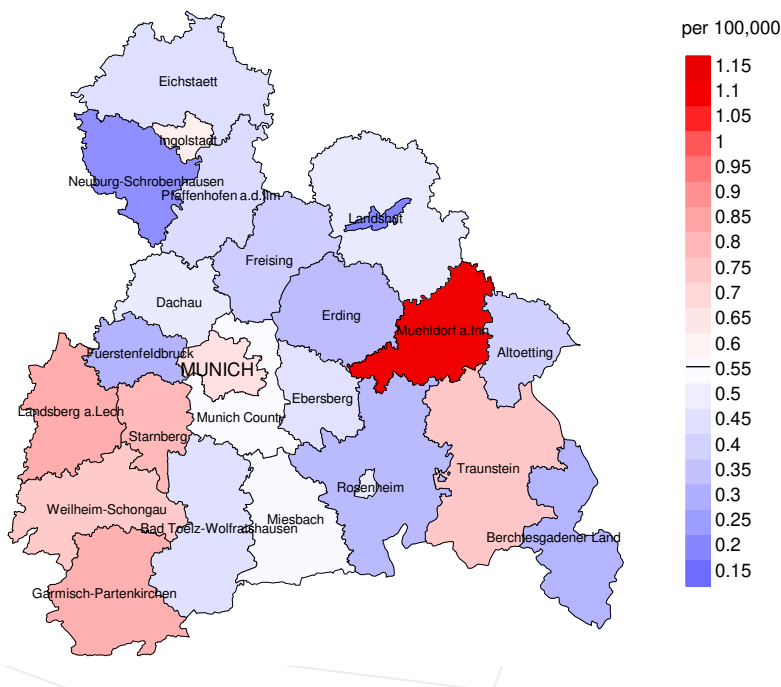
**Figure 17.** Distribution of age at death (bars; males: mean=62.0 yrs, median=61.2 yrs; females: mean=63.9 yrs, median=63.5 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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

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



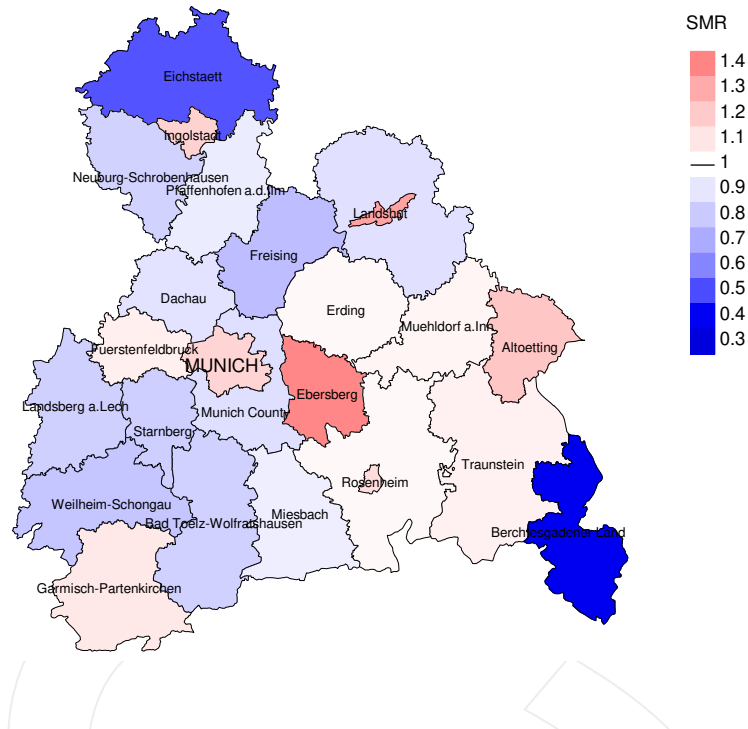
Average mortality (world standard population) 2007 - 2016: Females



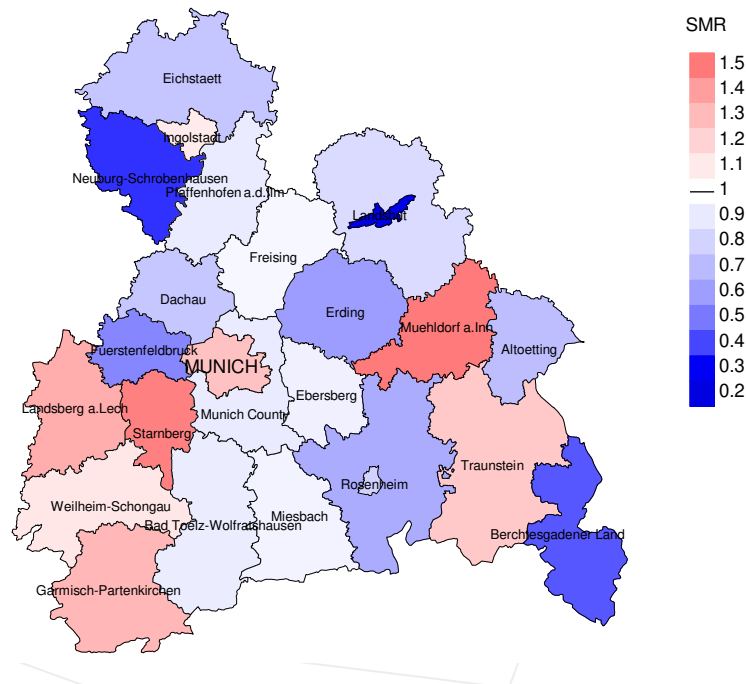
**Figure 18a.** Map of cancer mortality (world standard population) by county averaged for period 2007 to 2016. According to their individual mortality rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 2.3/100,000 WS N=952, females 0.6/100,000 WS N=274).

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 7 women died from oropharynx 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 1.5/100,000.

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=952, females N=274).

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 7 women died from oropharynx cancer. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 0.94. Though, the value of this parameter may vary with an underlying probability of 99% between 0.27 and 2.29, 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

**Recommended Citation**

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