

# Munich Cancer Registry



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## ICD-10 C00-C14: HN cancer

### Incidence and Mortality

Year of diagnosis	1998-2016
Patients	9,808
Diseases	10,156
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/bC0014E-ICD-10-C00-C14-HN-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
C00	Lip
C01	Base of tongue
C02	Other and unspecified parts of tongue
C03	Gum
C04	Floor of mouth
C05	Palate
C06	Other and unspecified parts of mouth
C07	Parotid gland
C08	Other and unspecified major salivary glands
C09	Tonsil
C10	Oropharynx Excl.: Topography code C10.1 Anterior surface of epiglottis
C11	Nasopharynx
C12	Piriform sinus
C13	Hypopharynx
C14	Other and ill-defined sites in the lip, oral cavity and pharynx

## 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	355	18	5.1	10.7	15.4	82.8	99.4
1999	390	17	4.4	12.5	15.3	81.3	96.4
2000	346	15	4.3	12.0	15.0	81.8	97.7
2001	360	24	6.7	12.5	14.8	79.4	96.7
2002	559	37	6.6	13.4	14.5	76.9	97.3 #
2003	567	24	4.2	14.0	14.0	76.2	97.5
2004	543	24	4.4	14.1	13.4	74.6	97.4
2005	571	25	4.4	14.5	13.0	70.6	96.1
2006	552	11	2.0	14.6	12.5	69.6	94.4
2007	673	39	5.8	14.6	12.1	67.3	85.0 #
2008	708	21	3.0	14.9	11.5	65.0	80.4
2009	686	11	1.6	15.5	10.9	64.1	81.6
2010	737	32	4.3	15.8	9.9	56.3	77.1
2011	653	25	3.8	16.3	8.8	53.0	77.8
2012	658	28	4.3	16.5	8.1	49.7	76.9
2013	684	20	2.9	16.7	7.5	47.7	76.9
2014	579	25	4.3	17.0	7.2	46.3	85.3
2015	334	21	6.3	17.3	6.9	42.5	96.7
2016	201	17	8.5	17.6	5.8	25.9	65.7 ##
1998-2016	10156	434	4.3	17.6	15.4	63.6	87.3

10,156 cases diagnosed 1998-2016 are related to a total of 9,808 patients. Currently, in 2,998 (30.6 %) of these 9,808 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 2,301 / 503 / 194 (23.5 % / 5.1 % / 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 579 cases has been diagnosed, of which 17.0 % 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 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	268	75.5	11	4.1	10.4	15.8	85.1	99.3
1999	280	71.8	9	3.2	12.2	15.6	85.0	97.1
2000	264	76.3	10	3.8	11.8	15.3	84.1	98.5
2001	266	73.9	15	5.6	12.3	15.2	81.2	97.0
2002	412	73.7	27	6.6	13.2	14.9	78.2	97.3 #
2003	418	73.7	16	3.8	14.2	14.4	78.2	98.3
2004	413	76.1	16	3.9	14.4	13.8	74.3	97.3
2005	423	74.1	17	4.0	14.7	13.4	72.1	96.2
2006	393	71.2	8	2.0	14.7	13.0	75.1	95.2
2007	496	73.7	26	5.2	14.8	12.6	71.2	86.1 #
2008	514	72.6	14	2.7	15.1	12.0	65.8	80.2
2009	492	71.7	7	1.4	15.6	11.3	67.1	81.5
2010	543	73.7	22	4.1	16.0	10.3	58.6	78.3
2011	465	71.2	16	3.4	16.5	9.3	55.7	78.1
2012	461	70.1	17	3.7	16.7	8.4	52.5	77.2
2013	484	70.8	12	2.5	16.8	7.6	49.6	77.1
2014	433	74.8	18	4.2	17.1	7.1	49.0	86.1
2015	230	68.9	14	6.1	17.5	6.8	45.2	97.4
2016	152	75.6	12	7.9	17.8	6.1	25.7	68.4 ##
1998-2016	7407	72.9	287	3.9	17.8	15.8	66.1	87.9

7,407 cases diagnosed 1998-2016 are related to a total of 7,139 patients. Currently, in 2,213 (31.0 %) of these 7,139 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 1,676 / 381 / 156 (23.5 % / 5.3 % / 2.2 %) 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 433 cases has been diagnosed, of which 17.1 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 7.1 % 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	87	24.5	7	8.0	11.5	14.5	75.9	100.0
1999	110	28.2	8	7.3	13.2	14.4	71.8	94.5
2000	82	23.7	5	6.1	12.5	14.2	74.4	95.1
2001	94	26.1	9	9.6	13.1	13.8	74.5	95.7
2002	147	26.3	10	6.8	14.0	13.4	73.5	97.3 #
2003	149	26.3	8	5.4	13.5	13.0	70.5	95.3
2004	130	23.9	8	6.2	13.0	12.4	75.4	97.7
2005	148	25.9	8	5.4	13.9	11.9	66.2	95.9
2006	159	28.8	3	1.9	14.3	11.2	56.0	92.5
2007	177	26.3	13	7.3	14.0	10.8	56.5	81.9 #
2008	194	27.4	7	3.6	14.2	10.2	62.9	80.9
2009	194	28.3	4	2.1	15.2	9.7	56.7	82.0
2010	194	26.3	10	5.2	15.0	8.8	50.0	73.7
2011	188	28.8	9	4.8	15.7	7.5	46.3	77.1
2012	197	29.9	11	5.6	16.1	7.3	43.1	76.1
2013	200	29.2	8	4.0	16.4	7.3	43.0	76.5
2014	146	25.2	7	4.8	16.6	7.7	38.4	82.9
2015	104	31.1	7	6.7	16.9	7.2	36.5	95.2
2016	49	24.4	5	10.2	17.0	4.5	26.5	57.1 ##
1998-2016	2749	27.1	147	5.3	17.0	14.5	57.0	85.8

2,749 cases diagnosed 1998-2016 are related to a total of 2,669 patients. Currently, in 785 (29.4 %) of these 2,669 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 625 / 122 / 38 (23.4 % / 4.6 % / 1.4 %) 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 146 cases has been diagnosed, of which 16.6 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 7.7 % 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 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	268	87	24.2	7.4	16.3	4.0	21.9	5.6	24.2	6.6
1999	280	110	25.0	9.3	16.3	5.2	22.6	7.2	25.0	8.2
2000	264	82	23.2	6.8	15.3	3.9	21.2	5.4	23.6	6.1
2001	266	94	23.0	7.7	15.1	4.4	20.7	6.0	23.1	6.8
2002	412	147	22.1	7.5	14.3	4.0	19.6	5.6	21.5	6.5
2003	418	149	22.3	7.6	14.6	4.2	20.2	5.8	21.8	6.7
2004	413	130	22.0	6.6	14.0	3.3	19.2	4.7	21.6	5.7
2005	423	148	22.3	7.4	14.2	4.2	19.2	5.8	21.4	6.5
2006	393	159	20.5	7.9	12.9	4.7	18.0	6.3	20.4	7.1
2007	496	177	22.4	7.7	13.7	4.2	19.0	5.8	21.5	6.6
2008	514	194	23.1	8.4	14.2	4.4	19.6	6.2	22.1	7.1
2009	492	194	22.0	8.3	13.2	4.6	18.3	6.3	20.7	7.2
2010	543	194	24.1	8.3	14.5	4.5	20.0	6.1	22.5	6.9
2011	465	188	20.8	8.0	12.0	4.4	16.7	6.0	19.1	6.8
2012	461	197	20.3	8.3	11.8	4.4	16.3	6.0	18.6	7.0
2013	484	200	21.0	8.4	12.3	4.3	17.0	5.9	19.3	6.8
2014	433	146	18.6	6.1	10.8	3.1	14.9	4.3	16.9	5.0
2015	230	104	9.7	4.3	5.3	2.2	7.5	3.1	8.9	3.5
2016	152	49	6.3	2.0	3.5	1.0	4.9	1.4	5.8	1.6
1998-2016	7407	2749	20.1	7.2	12.3	3.8	16.9	5.3	19.0	6.1

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	355	59.1	12.6	0.9	97.4	46.2	51.8	58.1	66.0	76.0
1999	390	60.5	12.5	13.9	95.7	47.9	52.0	58.8	66.9	78.7
2000	346	59.9	11.7	31.0	91.9	46.0	51.6	58.6	67.5	76.4
2001	360	61.1	12.4	16.4	96.4	47.6	53.1	60.1	67.6	77.2
2002	559	61.3	11.9	26.4	99.0	46.8	53.5	60.8	68.2	78.6
2003	567	60.5	11.8	10.7	98.2	46.4	53.1	59.4	67.8	76.9
2004	543	61.6	12.4	24.7	97.9	45.8	53.6	61.3	69.4	78.4
2005	571	61.4	12.1	4.1	103	46.8	53.5	61.2	67.7	77.8
2006	552	61.4	12.5	17.6	101	46.8	53.3	60.1	69.2	77.8
2007	673	62.4	12.3	7.7	101	47.3	53.8	62.6	70.5	77.8
2008	708	63.3	11.7	19.8	100	49.3	55.3	62.6	69.6	79.4
2009	686	63.1	12.2	16.6	98.4	48.1	54.9	62.8	70.8	79.9
2010	737	62.5	12.9	18.2	95.3	47.0	53.6	62.6	70.6	78.7
2011	653	63.7	12.7	14.4	96.9	48.6	55.0	63.9	72.0	79.7
2012	658	63.7	11.9	21.5	100	49.0	55.3	63.8	72.2	78.5
2013	684	64.3	12.3	12.1	95.5	50.1	55.9	64.1	72.3	79.9
2014	579	63.9	12.1	16.8	93.7	48.4	56.3	63.9	72.1	79.1
2015	334	66.2	11.3	28.5	95.0	51.7	57.8	65.8	74.5	82.0
2016	201	66.0	12.0	20.1	93.0	53.3	57.5	65.8	74.9	79.8
1998-2016	10156	62.5	12.3	0.9	103	47.8	54.2	62.0	70.4	78.7

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	268	57.6	11.2	0.9	87.6	46.0	51.3	57.3	63.8	71.0
1999	280	59.1	11.2	32.0	90.8	47.9	51.4	57.6	64.3	75.2
2000	264	59.5	10.5	35.6	89.7	47.5	51.7	58.4	66.6	73.6
2001	266	59.6	11.2	28.7	94.9	46.5	52.0	59.3	65.4	74.5
2002	412	59.7	10.5	26.4	96.8	46.6	52.9	59.9	65.3	73.0
2003	418	59.4	10.0	28.1	94.5	47.1	53.1	58.8	65.6	72.6
2004	413	60.2	11.4	26.7	92.4	45.5	53.0	60.1	66.3	75.3
2005	423	60.4	11.4	4.1	99.0	46.6	53.4	61.0	67.0	74.7
2006	393	61.1	11.3	17.6	92.0	47.2	53.8	59.7	67.7	76.9
2007	496	61.6	11.3	15.7	101	47.3	53.4	61.7	69.6	75.7
2008	514	62.3	10.8	19.8	100	49.3	54.7	62.1	68.8	76.8
2009	492	62.7	11.0	16.6	90.7	48.5	55.0	62.8	70.2	76.5
2010	543	61.8	12.3	18.2	95.3	46.9	53.3	61.3	69.9	76.6
2011	465	63.3	12.1	14.4	95.5	48.4	54.2	63.1	71.3	78.4
2012	461	62.9	11.0	21.6	94.3	49.2	54.8	62.6	70.8	77.2
2013	484	63.4	11.0	19.0	93.9	50.6	56.0	63.3	70.7	77.4
2014	433	63.4	11.1	25.6	93.5	48.5	56.3	62.8	70.9	77.1
2015	230	66.1	11.0	28.5	94.6	51.5	58.4	65.7	74.5	80.6
2016	152	65.4	11.6	20.1	91.6	52.8	57.4	65.0	74.6	78.2
1998-2016	7407	61.6	11.3	0.9	101	47.9	53.7	61.2	69.1	76.4

Table 3b

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

Year of diagnosis	Cases n	Std. dev.		Min. Max.		Median				
		Mean	dev.	Min.	Max.	10%	25%	50%	75%	90%
1998	87	63.9	15.2	9.5	97.4	49.6	54.5	61.8	75.9	83.1
1999	110	64.0	14.7	13.9	95.7	48.1	55.1	64.7	74.9	82.0
2000	82	61.3	14.7	31.0	91.9	43.3	51.1	59.5	74.0	80.7
2001	94	65.3	14.4	16.4	96.4	50.2	56.4	63.3	72.9	87.8
2002	147	65.9	14.3	31.4	99.0	48.1	55.3	63.5	77.7	84.2
2003	149	63.7	15.3	10.7	98.2	44.8	53.7	63.1	76.1	83.8
2004	130	66.4	14.1	24.7	97.9	48.9	57.0	67.2	76.8	83.3
2005	148	64.0	13.6	22.8	103	49.6	54.6	62.3	72.2	81.5
2006	159	62.2	15.0	19.0	101	45.4	51.8	61.7	71.5	84.0
2007	177	64.5	14.6	7.7	98.2	46.5	55.2	63.6	74.8	84.5
2008	194	65.9	13.6	25.6	98.4	50.2	57.2	65.8	74.3	83.6
2009	194	64.3	14.8	16.8	98.4	47.4	54.8	63.5	75.1	83.6
2010	194	64.4	14.1	21.9	91.8	47.4	54.0	65.9	72.6	85.0
2011	188	64.7	14.0	17.2	96.9	48.6	56.5	64.7	73.1	84.1
2012	197	65.6	13.7	21.5	100	48.4	57.5	65.1	73.8	82.9
2013	200	66.5	14.8	12.1	95.5	47.3	55.5	67.3	77.1	87.3
2014	146	65.4	14.6	16.8	93.7	47.8	57.2	66.4	75.2	84.1
2015	104	66.3	11.9	39.9	95.0	52.0	56.8	66.7	74.3	83.9
2016	49	68.0	13.2	38.8	93.0	53.7	57.5	67.0	75.0	88.5
1998-2016	2749	64.8	14.3	7.7	103	47.8	55.3	64.6	75.0	83.9

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	1	0.0	0.0			0.0	1	0.1	0.1
10-14	2	0.0	0.1	1	0.0	0.0	1	0.1	0.1
15-19	9	0.2	0.2	5	0.1	0.1	4	0.2	0.4
20-24	10	0.2	0.4	7	0.2	0.3	3	0.2	0.5
25-29	29	0.5	0.9	16	0.4	0.7	13	0.8	1.3
30-34	38	0.6	1.5	17	0.4	1.1	21	1.3	2.6
35-39	54	0.9	2.4	32	0.7	1.8	22	1.3	4.0
40-44	159	2.7	5.1	112	2.6	4.4	47	2.9	6.8
45-49	418	7.1	12.2	321	7.5	12.0	97	5.9	12.7
50-54	708	12.0	24.2	549	12.9	24.8	159	9.7	22.4
55-59	852	14.4	38.6	651	15.2	40.1	201	12.2	34.6
60-64	960	16.2	54.8	730	17.1	57.2	230	14.0	48.6
65-69	930	15.7	70.5	682	16.0	73.1	248	15.1	63.7
70-74	726	12.3	82.8	529	12.4	85.5	197	12.0	75.7
75-79	480	8.1	90.9	343	8.0	93.6	137	8.3	84.1
80-84	277	4.7	95.6	164	3.8	97.4	113	6.9	90.9
85+	260	4.4	100.0	111	2.6	100.0	149	9.1	100.0
All ages	5913	100.0		4270	100.0		1643	100.0	

Table 5

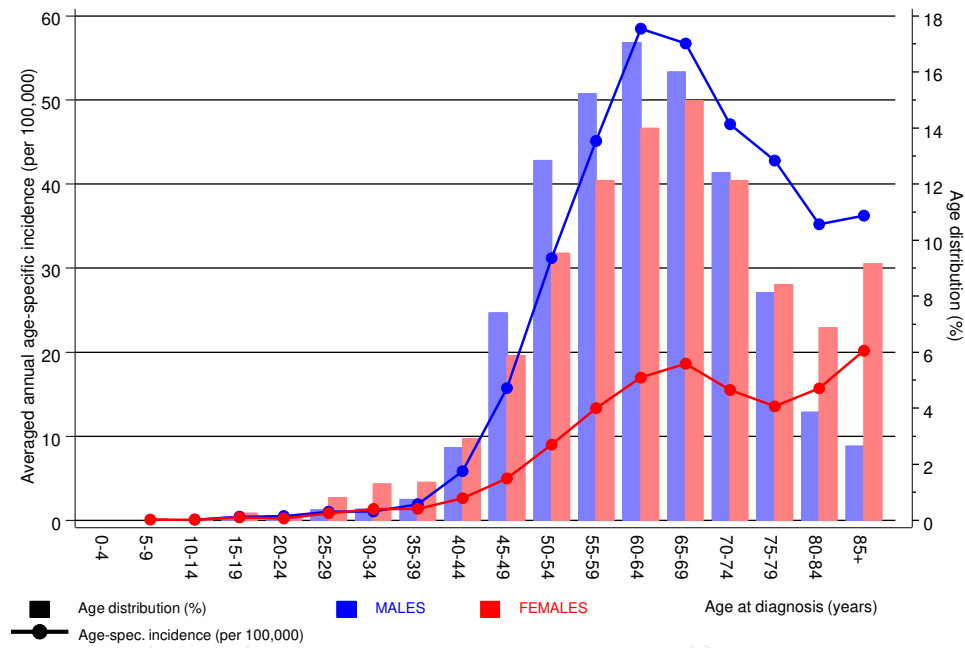
Age-specific incidence, DCO rate and proportion of all cancers for period 2007-2016

Age at diagnosis Years	Males n	Females n	Males Age- spec. incid.	Females Age- spec. incid.	Males DCO rate n=156 %	Females DCO rate n=80 %	Males	Females
							Prop.all cancers n=113978 %	Prop.all cancers n=112253 %
0- 4								
5- 9		1		0.1				1.2
10-14	1	1	0.1	0.1			0.9	1.0
15-19	5	4	0.4	0.3			2.0	1.9
20-24	7	3	0.5	0.2			1.5	0.8
25-29	16	13	1.0	0.8			2.3	1.6
30-34	17	21	1.1	1.3			1.8	1.4
35-39	31	22	1.9	1.4		4.5	2.2	0.9
40-44	109	47	5.8	2.6	0.9	2.1	5.0	1.0
45-49	311	95	15.7	5.0	0.6		7.9	1.4
50-54	539	154	31.2	9.0	1.5	1.9	8.8	1.8
55-59	639	196	45.1	13.3	2.3	3.1	6.9	2.1
60-64	716	226	58.5	17.0	2.8	3.1	5.4	2.0
65-69	672	242	56.7	18.6	3.6	1.7	3.6	1.7
70-74	521	196	47.1	15.5	5.8	2.6	2.5	1.3
75-79	341	136	42.8	13.6	5.3	2.2	2.1	1.0
80-84	162	111	35.2	15.7	6.8	10.8	1.5	1.0
85+	111	148	36.3	20.2	24.3	25.7	1.4	1.2
All ages	4198	1616			3.7	5.0	3.7	1.4
Incidence								
Raw			18.4	6.8				
WS			10.8	3.6				
ES			14.9	5.0				
BRD-S			17.0	5.7				

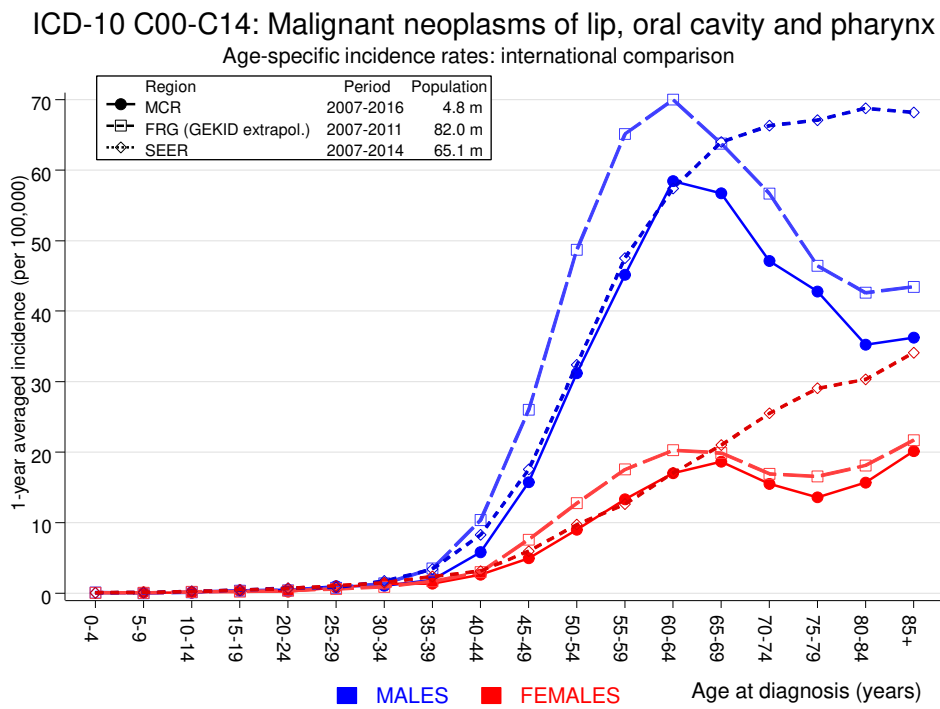
The age-specific incidence characterizes the disease risk in a particular age group. The age distribution depends on the patient population frequency in each age group and reflects the tangible clinical picture of everyday patients care (see following chart).

ICD-10 C00-C14: Malignant neoplasms of lip, oral cavity and pharynx

Age distribution and age-specific incidence 2007 - 2016 (Males: 4198, Females: 1616)



**Figure 6.** Age distribution (males: mean=63.0 yrs, median=62.8 yrs; females: mean=65.4 yrs, median=65.7 yrs) and age-specific incidence.



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

Reference:

Extrapolated age-specific patient population of Germany, data status middle of 2010. Association of Population-based Cancer Registries in Germany (GEKID e.V.). Berlin, 2014. <http://www.gekid.de>. Last access: 02/11/2015  
 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 %
	2	0.1	30.2	3.7	109.2 #	0.9	
C00 Lip	5	0.3	17.2	5.6	40.2 #	2.2	
C03-C06 Oral cavity	77	3.1	24.6	19.4	30.7 #	34.5	7.8
C07-C08 Salivary gland	4	0.6	6.9	1.9	17.6 #	1.6	
C09-C10 Oropharynx	92	4.0	22.8	18.3	27.9 #	41.1	1.1
C11 Nasopharynx	6	0.3	23.5	8.6	51.1 #	2.7	16.7
C12-C13 Hypopharynx	77	2.2	35.3	27.8	44.1 #	34.9	10.4
C14 ENT cancer	3	0.1	40.8	8.4	119.1 #	1.4	100.0
C15 Oesophagus	141	5.9	24.0	20.2	28.3 #	63.1	14.9
C16 Stomach	25	10.1	2.5	1.6	3.7 #	7.0	12.0
C17 Small intestine	3	1.6	1.9	0.4	5.6	0.7	66.7
C18 Colon	61	24.2	2.5	1.9	3.2 #	17.2	4.9
C19-C20 Rectum	31	15.4	2.0	1.4	2.9 #	7.3	
C21 Anus/canal	5	0.7	7.3	2.4	17.0 #	2.0	
C22 Liver	38	7.9	4.8	3.4	6.6 #	14.0	13.2
C23-C24 Bile	2	2.5	0.8	0.1	2.9	-0.2	50.0
C25 Pancreas	27	9.8	2.8	1.8	4.0 #	8.0	18.5
C30-C31 Sinuses	6	0.5	11.2	4.1	24.4 #	2.6	16.7
C32 Larynx	83	3.4	24.7	19.7	30.6 #	37.2	26.5
C33-C34 Lung	316	33.2	9.5	8.5	10.6 #	132.1	12.3
C38,C45 Mesothelioma	2	1.7	1.1	0.1	4.1	0.1	
C43 Malign. melanoma	28	12.7	2.2	1.5	3.2 #	7.2	10.7
C46,C49 Soft tissue	8	1.5	5.2	2.2	10.2 #	3.0	12.5
C60 Penis	2	0.6	3.1	0.4	11.3	0.6	
C61 Prostate	96	77.9	1.2	1.0	1.5	8.5	7.3
C64 Kidney	29	10.2	2.9	1.9	4.1 #	8.8	6.9
C65 Renal pelvis	4	1.0	3.8	1.0	9.8 #	1.4	
C67 Bladder	29	10.7	2.7	1.8	3.9 #	8.5	6.9
C70-C72 CNS cancer	3	3.9	0.8	0.2	2.3	-0.4	
C73 Thyroid	13	2.4	5.5	2.9	9.3 #	5.0	7.7
C76-C79 CUP	16	4.5	3.6	2.0	5.8 #	5.4	
C81 Hodgkin lymphoma	4	0.7	5.6	1.5	14.3 #	1.5	50.0
C82-C85 NHL	27	10.7	2.5	1.7	3.7 #	7.6	11.1
C90 Mult. myeloma	2	3.3	0.6	0.1	2.2	-0.6	
C91-C96 Leukaemia	11	4.0	2.8	1.4	4.9 #	3.3	36.4
Others, specified	7	3.1	2.3	0.9	4.7	1.8	
Not observed	0	1.6	0.0	0.0	2.3	-0.8	
All further malignancies	1285	276.5	4.6	4.4	4.9 #	471.1	11.4

Patients 6813  
 Median age at next malignancy (years) 64.7  
 Person-years 21408  
 Mean observation time (years) 3.1  
 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

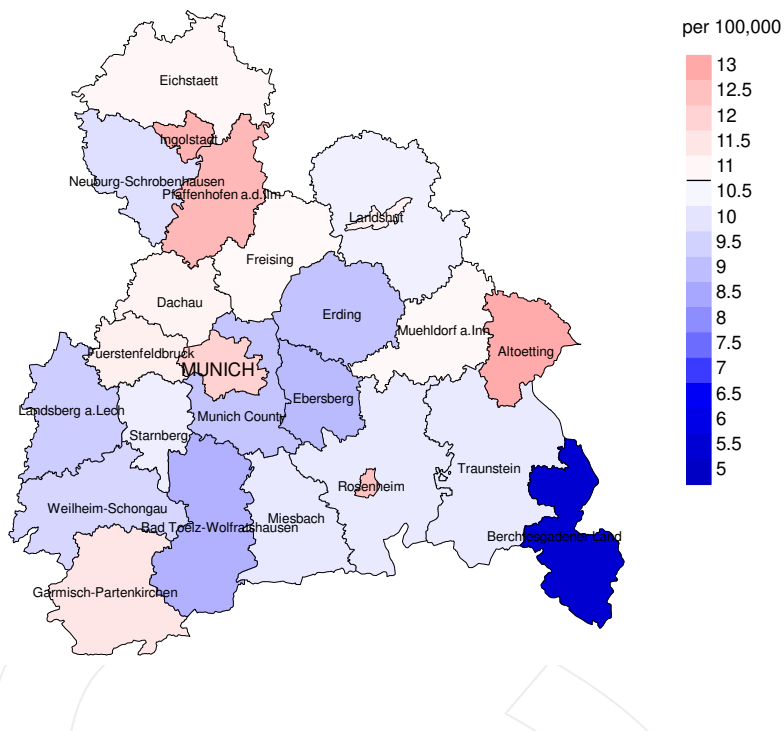
## FEMALES

Diagnosis	Observed n	Expected n	SIR	CI 95%	CI 95%	EAR	DCO %
C03-C06 Oral cavity	19	0.6	31.7	19.1	49.5 #	19.7	
C07-C08 Salivary gland	3	0.2	19.6	4.1	57.4 #	3.1	
C09-C10 Oropharynx	32	0.4	72.4	49.5	102.1 #	33.9	
C11 Nasopharynx	3	0.0	83.0	17.1	242.7 #	3.2	
C12-C13 Hypopharynx	17	0.1	140.3	81.7	224.7 #	18.1	23.5
C14 ENT cancer	4	0.0	246.1	67.0	630.1 #	4.3	75.0
C15 Oesophagus	30	0.6	47.4	32.0	67.6 #	31.5	6.7
C16 Stomach	8	3.2	2.5	1.1	4.9 #	5.1	12.5
C18 Colon	18	9.1	2.0	1.2	3.1 #	9.6	
C19-C20 Rectum	6	3.9	1.5	0.6	3.4	2.3	
C22 Liver	10	1.1	8.8	4.2	16.1 #	9.5	20.0
C23-C24 Bile	3	1.3	2.3	0.5	6.8	1.8	
C25 Pancreas	10	4.2	2.4	1.1	4.4 #	6.2	30.0
C30-C31 Sinuses	6	0.1	45.3	16.6	98.7 #	6.3	33.3
C32 Larynx	17	0.2	88.7	51.7	142.1 #	18.0	17.6
C33-C34 Lung	93	7.4	12.6	10.2	15.4 #	91.9	18.3
C43 Malign. melanoma	7	3.7	1.9	0.8	3.9	3.5	14.3
C50 Breast	47	30.4	1.5	1.1	2.1 #	17.8	6.4
C51 Vulva	4	0.9	4.2	1.1	10.8 #	3.3	
C53 Cervix uteri	7	1.4	5.2	2.1	10.7 #	6.1	14.3
C54 Corpus uteri	6	5.4	1.1	0.4	2.4	0.7	
C56 Ovary	10	3.9	2.5	1.2	4.7 #	6.5	10.0
C64 Kidney	4	2.3	1.7	0.5	4.5	1.8	25.0
C65 Renal pelvis	2	0.3	6.9	0.8	25.1	1.8	
C67 Bladder	4	1.8	2.3	0.6	5.8	2.4	50.0
C70-C72 CNS cancer	4	1.3	3.0	0.8	7.8	2.9	50.0
C73 Thyroid	7	1.8	3.8	1.5	7.9 #	5.6	14.3
C76-C79 CUP	5	1.7	2.9	1.0	6.8	3.5	
C82-C85 NHL	12	3.7	3.3	1.7	5.7 #	9.0	
C90 Mult. myeloma	2	1.2	1.7	0.2	6.3	0.9	50.0
C91-C96 Leukaemia	4	1.5	2.7	0.7	6.8	2.7	25.0
Others, specified	8	1.9	4.1	1.8	8.1 #	6.5	
Not observed	0	1.8	0.0	0.0	2.0	-2.0	
All further malignancies	412	97.6	4.2	3.8	4.6 #	337.3	12.4
Patients		2507					
Median age at next malignancy (years)		67.5					
Person-years		9320					
Mean observation time (years)		3.7					
Median observation time (years)		2.3					

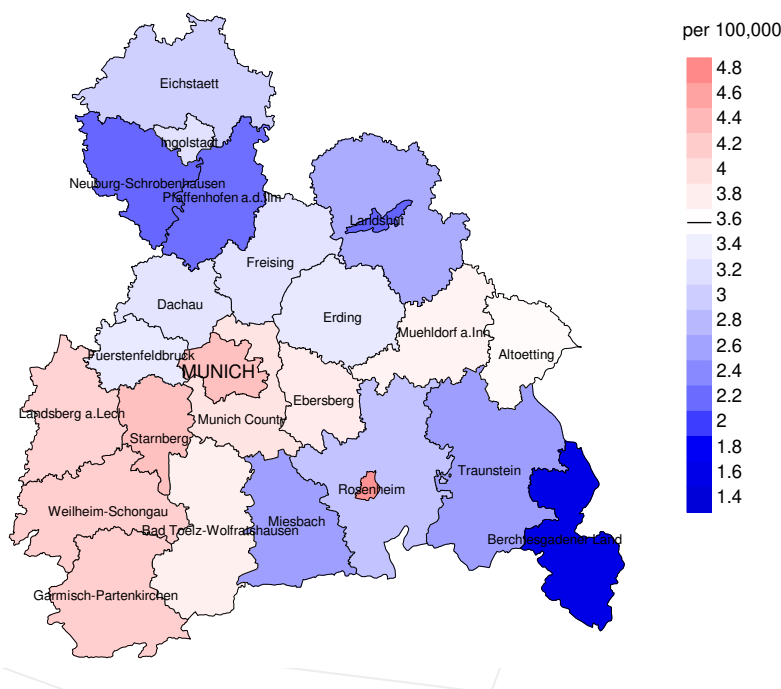
# The occurrence of further malignancy listed is statistically significant.

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

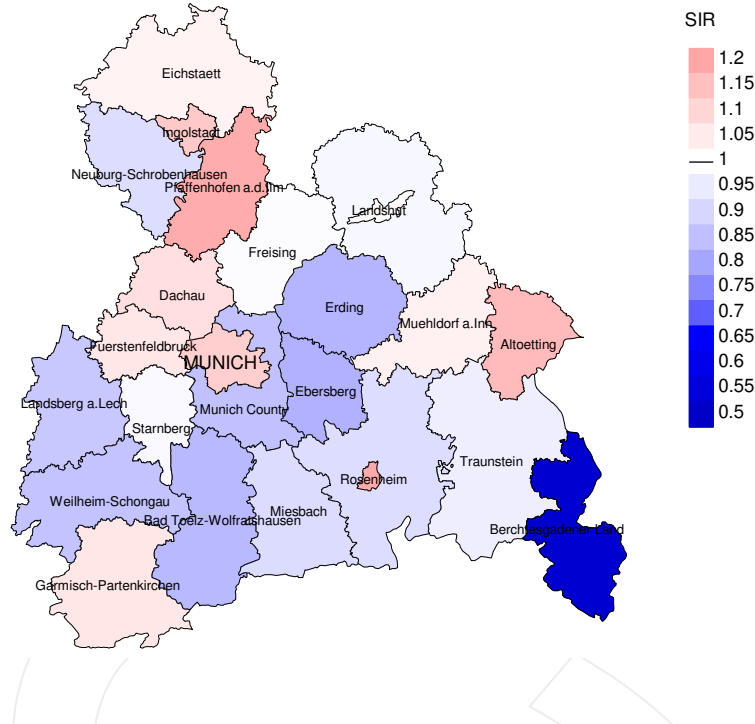


**Figure 8a.** Map of cancer incidence (world standard population, incl. DCO cases) by county averaged for period 2007 to 2016. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 10.8/100,000 WS N=4,198, females 3.6/100,000 WS N=1,616).

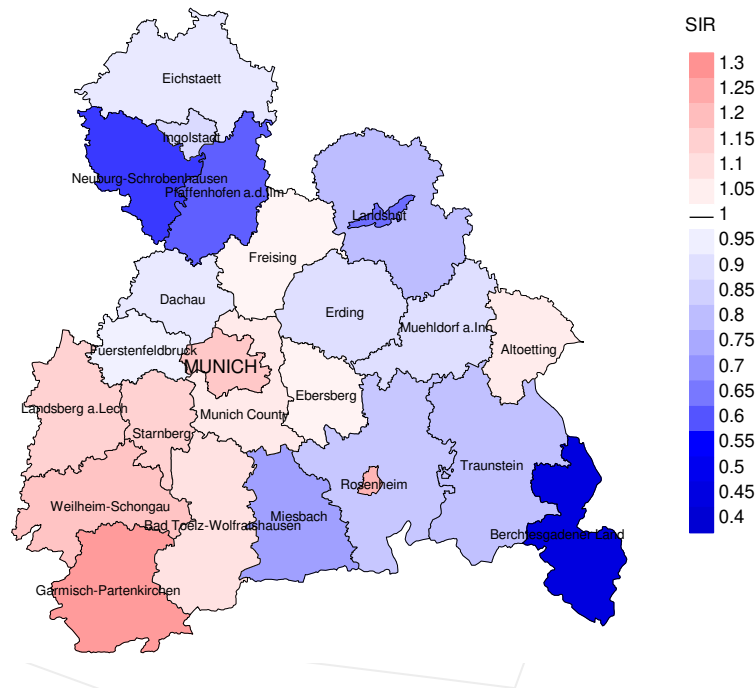
The results should be interpreted with caution! E.g., in county Ebersberg with a population of 66,416 female residents (averaged) in the period from 2007 to 2016 a total of 46 women were identified with newly diagnosed HN cancer. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 3.8/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 2.4 and 5.9/100,000.



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=4,198, females N=1,616).

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 46 women were identified with newly diagnosed HN cancer. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 1.04. Though, the value of this parameter may vary with an underlying probability of 99% between 0.69 and 1.50, 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	355	99.4	5.1	294	82.8	95.9
1999	390	96.4	4.4	317	81.3	89.9
2000	346	97.7	4.3	283	81.8	95.8
2001	360	96.7	6.7	286	79.4	95.1
2002	559	97.3	6.6	430	76.9	96.3
2003	567	97.5	4.2	432	76.2	97.0
2004	543	97.4	4.4	405	74.6	95.8
2005	571	96.1	4.4	403	70.6	98.8
2006	552	94.4	2.0	384	69.6	98.2
2007	673	85.0	5.8	453	67.3	97.1
2008	708	80.4	3.0	460	65.0	97.8
2009	686	81.6	1.6	440	64.1	98.6
2010	737	77.1	4.3	415	56.3	98.6
2011	653	77.8	3.8	346	53.0	95.7
2012	658	76.9	4.3	327	49.7	96.9
2013	684	76.9	2.9	326	47.7	96.9
2014	579	85.3	4.3	268	46.3	95.9
2015	334	96.7	6.3	142	42.5	93.7
2016	201	65.7	8.5	52	25.9	80.8
1998-2016	10156	87.3	4.3	6463	63.6	96.5

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	355	236	91.5	56	15.8
1999	390	244	89.3	59	15.1
2000	346	251	93.6	50	14.5
2001	360	279	91.0	64	17.8
2002	559	378	97.6	87	15.6
2003	567	396	96.2	86	15.2
2004	543	409	96.6	93	17.1
2005	571	378	97.4	85	14.9
2006	552	427	97.0	85	15.4
2007	673	468	97.4	103	15.3
2008	708	440	98.4	98	13.8
2009	686	483	98.6	89	13.0
2010	737	485	99.0	102	13.8
2011	653	483	97.7	94	14.4
2012	658	508	97.2	94	14.3
2013	684	502	98.4	108	15.8
2014	579	484	97.3	105	18.1
2015	334	494	99.0	90	26.9
2016	201	345	98.8	42	20.9
1998-2016	10156	7690	97.0	1590	15.7

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	236	73.3	26.7	90.3
1999	244	68.0	32.0	86.2
2000	251	77.3	22.7	89.8
2001	279	75.6	24.4	89.4
2002	378	78.0	22.0	90.5
2003	396	77.0	23.0	87.1
2004	409	80.2	19.8	91.6
2005	378	82.3	17.7	91.0
2006	427	77.8	22.2	87.0
2007	468	79.1	20.9	89.0
2008	440	78.9	21.1	87.3
2009	483	79.1	20.9	89.7
2010	485	80.2	19.8	90.2
2011	483	73.9	26.1	85.0
2012	508	77.6	22.4	87.7
2013	502	77.1	22.9	87.9
2014	484	75.4	24.6	87.0
2015	494	73.7	26.3	85.5
2016	345	68.1	31.9	80.9
1998-2016	7690	76.8	23.2	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	171	60.5	58.9	63.7	60.5
1999	187	58.9	58.1	62.6	58.0
2000	193	61.6	61.2	65.7	61.7
2001	218	60.5	60.3	64.4	60.5
2002	294	61.7	61.3	66.5	61.4
2003	306	63.1	62.5	67.8	62.6
2004	315	62.5	61.3	66.0	62.1
2005	271	64.3	63.8	73.1	64.1
2006	326	64.1	63.0	67.1	63.9
2007	370	64.5	63.3	69.6	63.8
2008	329	66.2	65.0	69.1	65.7
2009	354	66.4	65.2	70.8	65.4
2010	374	65.9	64.3	70.7	64.7
2011	374	68.4	66.1	72.1	66.7
2012	376	68.9	68.8	71.1	68.6
2013	355	67.7	66.0	71.6	66.5
2014	365	69.6	68.1	74.7	68.9
2015	358	68.2	67.3	71.9	67.4
2016	244	71.3	68.0	76.7	69.8
1998-2016	5780	65.2	64.1	70.1	64.6

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	65	72.7	68.6	77.7	72.2
1999	57	72.7	63.9	79.2	64.9
2000	58	65.8	61.0	80.8	65.8
2001	61	70.4	68.0	72.5	68.0
2002	84	71.9	69.2	77.5	71.8
2003	90	69.7	64.7	77.2	66.2
2004	94	73.7	73.7	74.5	73.7
2005	107	68.5	64.6	84.9	66.0
2006	101	72.8	68.5	81.7	68.9
2007	98	72.8	69.3	84.4	69.4
2008	111	69.2	67.8	78.1	68.0
2009	129	70.4	68.6	81.7	69.8
2010	111	70.6	67.5	81.7	68.2
2011	109	72.3	69.8	82.4	70.2
2012	132	72.6	70.1	82.9	71.5
2013	147	74.0	70.8	83.4	71.8
2014	119	75.7	71.6	79.5	73.0
2015	136	71.7	71.0	73.3	71.0
2016	101	77.2	72.9	83.2	73.4
1998-2016	1910	72.0	69.3	80.6	70.3

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	128	11.6	0.48	7.6	0.47	10.4	0.48	11.8	0.49
1999	136	12.2	0.49	7.7	0.48	10.9	0.49	12.3	0.50
2000	147	12.9	0.56	8.0	0.52	11.6	0.55	14.0	0.59
2001	167	14.4	0.64	9.3	0.63	13.0	0.64	14.7	0.66
2002	236	12.7	0.58	7.9	0.56	11.2	0.58	12.8	0.60
2003	243	13.0	0.59	7.9	0.55	11.3	0.57	12.9	0.60
2004	254	13.5	0.62	8.4	0.61	11.8	0.62	13.5	0.63
2005	227	12.0	0.54	7.0	0.50	10.0	0.52	11.6	0.55
2006	262	13.7	0.67	8.3	0.65	11.6	0.65	13.3	0.66
2007	297	13.4	0.61	7.9	0.59	11.3	0.60	13.0	0.62
2008	270	12.1	0.53	7.0	0.50	9.9	0.52	11.6	0.54
2009	289	12.9	0.60	7.3	0.57	10.4	0.58	12.2	0.60
2010	304	13.5	0.57	7.7	0.54	11.0	0.56	12.7	0.58
2011	284	12.7	0.62	7.0	0.60	10.0	0.61	11.8	0.63
2012	292	12.9	0.64	6.7	0.57	9.7	0.60	11.8	0.64
2013	277	12.0	0.58	6.5	0.54	9.3	0.55	11.0	0.58
2014	288	12.4	0.68	6.4	0.61	9.2	0.63	11.1	0.67
2015	265	11.1	1.17	5.8	1.12	8.4	1.15	10.1	1.16
2016	170	7.1	1.13	3.7	1.08	5.3	1.09	6.5	1.13
1998-2016	4536	12.3	0.62	7.1	0.59	10.1	0.60	11.8	0.63

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	45	3.8	0.52	1.8	0.45	2.6	0.47	3.3	0.51
1999	30	2.5	0.28	1.3	0.25	1.9	0.26	2.2	0.27
2000	47	3.9	0.58	2.1	0.54	3.0	0.55	3.4	0.57
2001	44	3.6	0.47	1.7	0.40	2.5	0.41	3.0	0.45
2002	60	3.1	0.41	1.5	0.38	2.2	0.39	2.6	0.40
2003	64	3.2	0.43	1.7	0.40	2.4	0.42	2.9	0.43
2004	74	3.7	0.57	1.6	0.49	2.4	0.51	3.0	0.54
2005	84	4.2	0.58	2.1	0.52	3.1	0.55	3.6	0.56
2006	71	3.5	0.46	1.5	0.34	2.3	0.37	2.8	0.40
2007	73	3.2	0.42	1.4	0.35	2.1	0.37	2.5	0.39
2008	77	3.3	0.40	1.6	0.37	2.3	0.38	2.7	0.39
2009	94	4.0	0.49	1.9	0.43	2.8	0.45	3.2	0.46
2010	85	3.6	0.45	1.8	0.42	2.6	0.43	3.0	0.45
2011	75	3.2	0.40	1.4	0.33	2.1	0.35	2.4	0.36
2012	102	4.3	0.53	1.9	0.45	2.8	0.47	3.4	0.49
2013	110	4.6	0.56	2.0	0.47	2.9	0.49	3.5	0.53
2014	79	3.3	0.54	1.4	0.45	2.0	0.47	2.5	0.50
2015	99	4.1	0.99	1.7	0.84	2.6	0.87	3.1	0.93
2016	65	2.6	1.33	1.0	1.02	1.5	1.09	1.9	1.21
1998-2016	1378	3.6	0.51	1.7	0.44	2.4	0.46	2.9	0.48

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	4	0.1	0.1	3	0.1	0.1	1	0.1	0.1
25-29	3	0.1	0.2	1	0.0	0.1	2	0.2	0.3
30-34	4	0.1	0.3	1	0.0	0.2	3	0.3	0.7
35-39	9	0.3	0.6	5	0.2	0.4	4	0.5	1.2
40-44	45	1.3	1.8	37	1.4	1.7	8	0.9	2.1
45-49	141	3.9	5.7	115	4.2	5.9	26	3.0	5.1
50-54	327	9.1	14.8	273	10.0	15.9	54	6.3	11.4
55-59	489	13.6	28.4	409	14.9	30.8	80	9.3	20.7
60-64	535	14.9	43.3	423	15.5	46.3	112	13.0	33.8
65-69	622	17.3	60.6	478	17.5	63.8	144	16.8	50.5
70-74	545	15.2	75.8	422	15.4	79.2	123	14.3	64.8
75-79	384	10.7	86.5	301	11.0	90.2	83	9.7	74.5
80-84	242	6.7	93.2	162	5.9	96.1	80	9.3	83.8
85+	245	6.8	100.0	106	3.9	100.0	139	16.2	100.0
All ages	3595	100.0		2736	100.0		859	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	3	1	0.2	0.43	0.1	0.33	5.3	3.0
25-29	1	2	0.1	0.06	0.1	0.15	1.4	2.7
30-34	1	3	0.1	0.06	0.2	0.14	1.0	2.5
35-39	5	4	0.3	0.16	0.3	0.18	2.5	1.4
40-44	37	8	2.0	0.34	0.4	0.17	7.5	1.2
45-49	115	26	5.8	0.37	1.4	0.27	10.0	2.0
50-54	273	54	15.8	0.51	3.2	0.35	13.3	2.7
55-59	409	80	28.9	0.64	5.4	0.41	12.1	2.8
60-64	423	112	34.5	0.59	8.4	0.50	8.5	3.0
65-69	478	144	40.3	0.71	11.1	0.60	6.6	2.7
70-74	422	123	38.1	0.81	9.7	0.63	4.5	1.8
75-79	301	83	37.8	0.88	8.3	0.61	3.3	1.2
80-84	162	80	35.2	1.00	11.3	0.72	2.1	1.2
85+	106	139	34.6	0.95	18.9	0.94	1.6	1.5
All ages	2736	859					5.2	1.9
Mortality								
Raw			12.0	0.65	3.6	0.53		
WS			6.5	0.61	1.6	0.45		
ES			9.4	0.63	2.3	0.47		
BRD-S			11.1	0.65	2.8	0.50		
PYLL-70								
per 100,000			90.4		21.7			
ES			78.2		18.2			
AYLL-70			10.5		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	117	5.2			5	4.3	112	95.7
C09-C10 Oropharynx	145	6.4			37	25.5	108	74.5
C12-C13 Hypopharynx	103	4.6			33	32.0	70	68.0
C15 Oesophagus	227	10.0	40	17.6	38	16.7	149	65.6
C16 Stomach	46	2.0	13	28.3	3	6.5	30	65.2
C18 Colon	80	3.5	28	35.0	4	5.0	48	60.0
C19-C20 Rectum	61	2.7	16	26.2	4	6.6	41	67.2
C22 Liver	58	2.6	6	10.3	7	12.1	45	77.6
C25 Pancreas	42	1.9	5	11.9	1	2.4	36	85.7
C32 Larynx	66	2.9			11	16.7	55	83.3
C33-C34 Lung	487	21.5	61	12.5	51	10.5	375	77.0
C43 Malign. melanoma	35	1.5	15	42.9	4	11.4	16	45.7
C44 Skin others	234	10.3	79	33.8	32	13.7	123	52.6
C61 Prostate	166	7.3	92	55.4	10	6.0	64	38.6
C64 Kidney	47	2.1	20	42.6	5	10.6	22	46.8
C67 Bladder	65	2.9	28	43.1	1	1.5	36	55.4
C76-C79 CUP	59	2.6	33	55.9	5	8.5	21	35.6
C82-C85 NHL	47	2.1	22	46.8	7	14.9	18	38.3
Others, specified	177	7.8	75	42.4	13	7.3	89	50.3
All further malignancies	2262	100.0	533	23.6	271	12.0	1458	64.5

Further malignancies with number of cases 1 to 19 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	3.7			2	8.0	23	92.0
C09–C10 Oropharynx	31	4.6			7	22.6	24	77.4
C12–C13 Hypopharynx	20	3.0			5	25.0	15	75.0
C15 Oesophagus	49	7.3	5	10.2	7	14.3	37	75.5
C16 Stomach	19	2.8	5	26.3	4	21.1	10	52.6
C18 Colon	31	4.6	15	48.4	2	6.5	14	45.2
C19–C20 Rectum	8	1.2	3	37.5			5	62.5
C22 Liver	9	1.3	1	11.1	2	22.2	6	66.7
C25 Pancreas	12	1.8	1	8.3	1	8.3	10	83.3
C30–C31 Sinuses	11	1.6	3	27.3	1	9.1	7	63.6
C32 Larynx	28	4.2	9	32.1	7	25.0	12	42.9
C33–C34 Lung	115	17.1	7	6.1	10	8.7	98	85.2
C43 Malign. melanoma	9	1.3	2	22.2	1	11.1	6	66.7
C44 Skin others	41	6.1	14	34.1	4	9.8	23	56.1
C50 Breast	106	15.8	65	61.3	5	4.7	36	34.0
C53 Cervix uteri	22	3.3	16	72.7			6	27.3
C54 Corpus uteri	15	2.2	11	73.3	1	6.7	3	20.0
C56 Ovary	14	2.1	7	50.0			7	50.0
C67 Bladder	8	1.2	4	50.0			4	50.0
C73 Thyroid	10	1.5	7	70.0	1	10.0	2	20.0
C76–C79 CUP	18	2.7	11	61.1			7	38.9
C82–C85 NHL	17	2.5	8	47.1	1	5.9	8	47.1
Others, specified	55	8.2	10	18.2	8	14.5	37	67.3
All further malignancies	673	100.0	204	30.3	69	10.3	400	59.4

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 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	3	1	0.2	0.50	0.1	0.33	5.9	3.2
25-29	1	2	0.1	0.07	0.1	0.17	1.5	3.0
30-34	1	3	0.1	0.06	0.2	0.16	1.0	2.8
35-39	3	2	0.2	0.11	0.1	0.12	1.6	0.8
40-44	33	8	1.8	0.32	0.4	0.18	7.2	1.3
45-49	94	23	4.8	0.34	1.2	0.27	9.0	2.0
50-54	227	43	13.1	0.49	2.5	0.33	12.6	2.6
55-59	333	64	23.5	0.65	4.4	0.41	11.3	2.7
60-64	334	85	27.3	0.60	6.4	0.47	8.0	2.8
65-69	367	114	31.0	0.71	8.8	0.63	6.3	2.7
70-74	321	92	29.0	0.88	7.3	0.62	4.5	1.7
75-79	213	59	26.7	0.96	5.9	0.60	3.2	1.1
80-84	105	57	22.8	1.06	8.1	0.70	1.9	1.1
85+	70	105	22.9	1.08	14.3	0.88	1.5	1.4
All ages	2105	658					5.2	1.8
Mortality								
Raw			9.2	0.65	2.8	0.51		
WS			5.1	0.60	1.3	0.44		
ES			7.3	0.62	1.8	0.46		
BRD-S			8.5	0.65	2.2	0.48		
PYLL-70								
per 100,000			73.8		17.6			
ES			63.9		14.8			
AYLL-70			10.7		10.2			

\* See corresponding tables with multiple malignancies.

Table 16

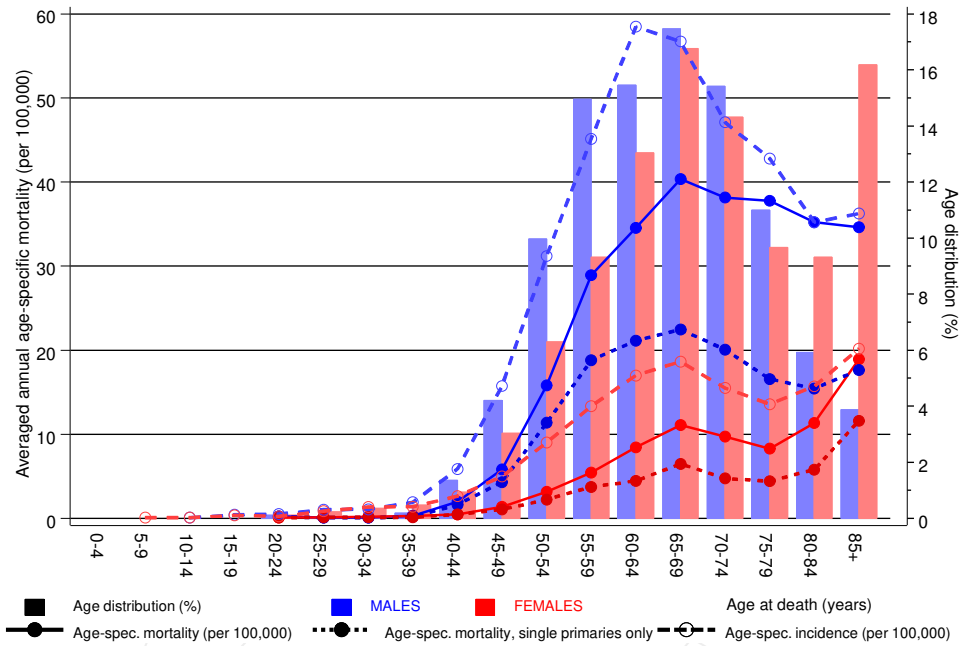
Age-specific mortality (cancer-related) and proportion of all cancers  
for period 2007-2016  
(**Single primaries only** \*)

Age at death Years	Males		Males		Females		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	3	1	0.2	0.50	0.1	0.33	5.9	3.2
25-29	1	2	0.1	0.07	0.1	0.18	1.5	3.1
30-34	1	2	0.1	0.06	0.1	0.12	1.0	1.9
35-39	3	2	0.2	0.12	0.1	0.12	1.6	0.8
40-44	30	8	1.6	0.34	0.4	0.20	6.6	1.4
45-49	85	20	4.3	0.34	1.0	0.27	8.2	1.8
50-54	196	38	11.3	0.47	2.2	0.32	11.0	2.3
55-59	266	55	18.8	0.59	3.7	0.41	9.2	2.3
60-64	259	59	21.1	0.51	4.4	0.36	6.3	2.0
65-69	266	84	22.4	0.61	6.5	0.52	4.7	2.0
70-74	222	60	20.1	0.74	4.7	0.46	3.2	1.2
75-79	132	44	16.6	0.67	4.4	0.52	2.1	0.8
80-84	71	41	15.4	0.81	5.8	0.55	1.4	0.8
85+	54	85	17.6	0.93	11.6	0.76	1.2	1.2
All ages	1589	501					4.0	1.4
Mortality								
Raw			7.0	0.56	2.1	0.44		
WS			4.0	0.52	1.0	0.37		
ES			5.6	0.54	1.4	0.39		
BRD-S			6.4	0.55	1.7	0.41		
PYLL-70								
per 100,000			61.5		14.8			
ES			53.2		12.5			
AYLL-70			11.2		10.9			

\* See corresponding tables with multiple malignancies.

ICD-10 C00-C14: Malignant neoplasms of lip, oral cavity and pharynx

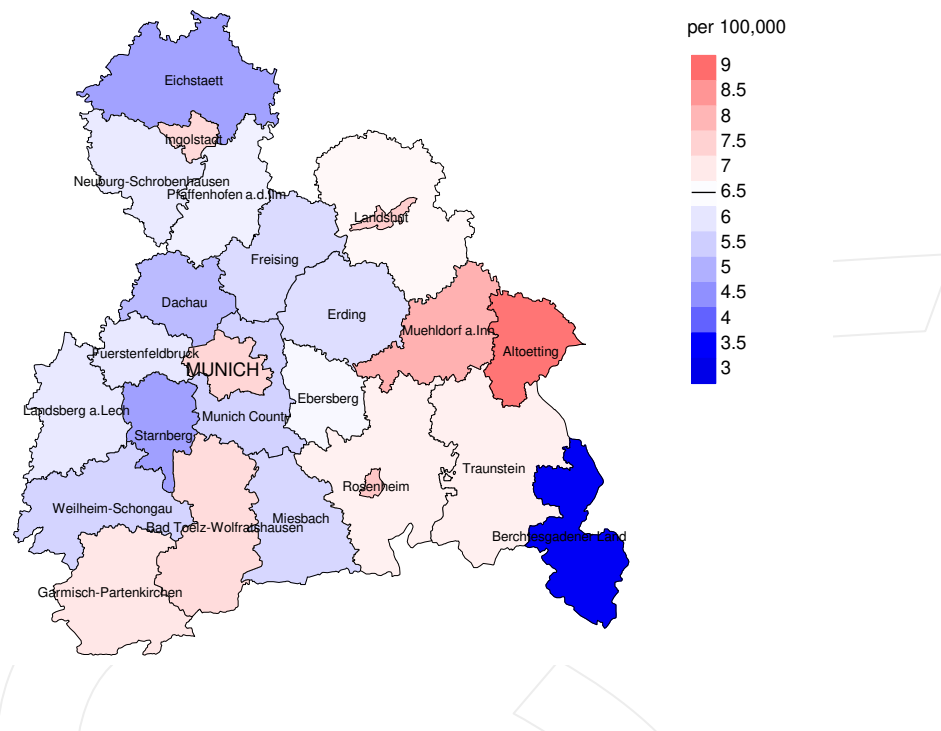
Age distribution and age-specific mortality 2007 - 2016 (Males: 2736, Females: 859)



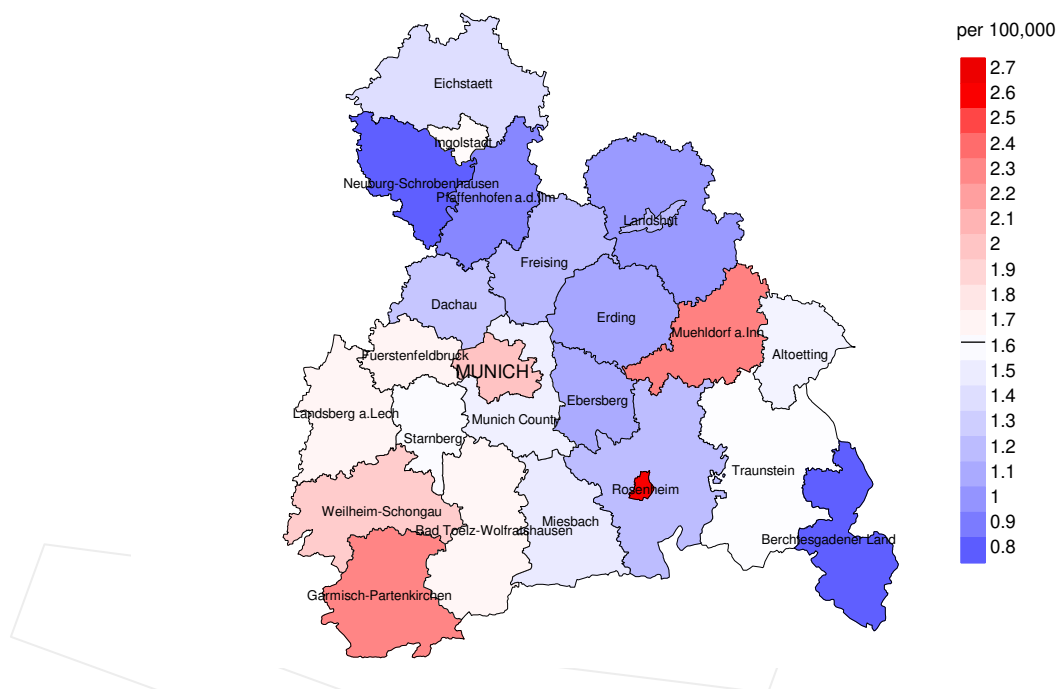
**Figure 17.** Distribution of age at death (bars; males: mean=62.4 yrs, median=61.9 yrs; females: mean=66.3 yrs, median=66.3 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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

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



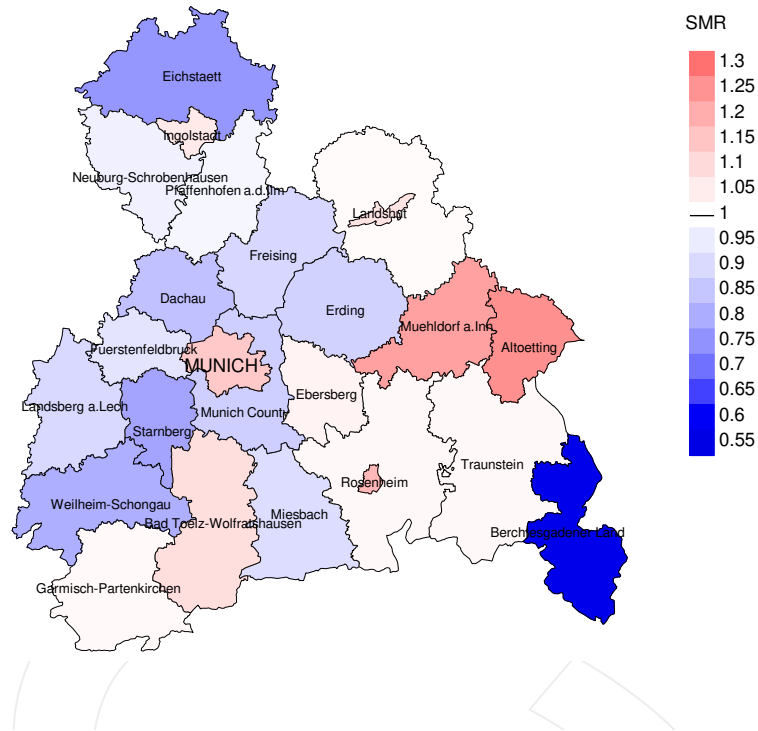
Average mortality (world standard population) 2007 - 2016: Females



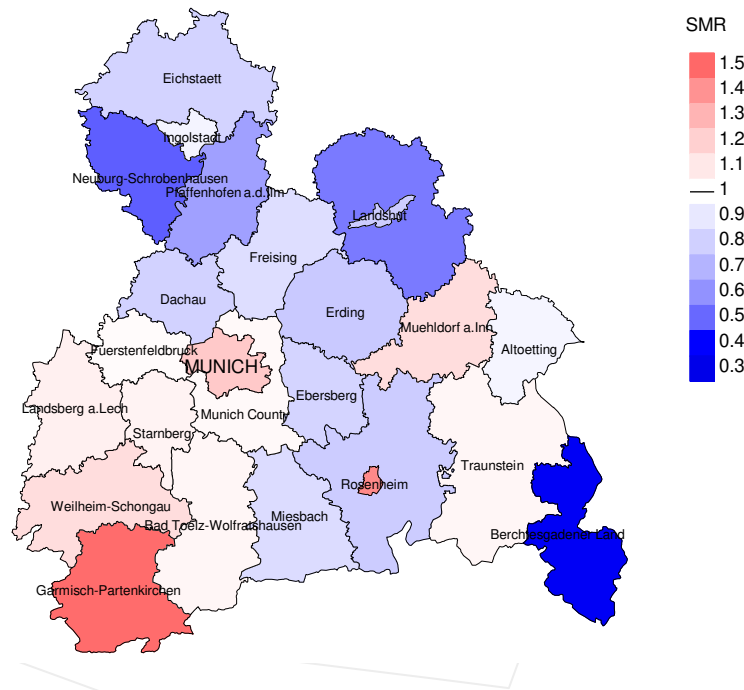
**Figure 18a.** Map of cancer mortality (world standard population) by county averaged for period 2007 to 2016. According to their individual mortality rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 6.5/100,000 WS N=2,736, females 1.6/100,000 WS N=859).

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 19 women died from HN cancer. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 1.1/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.5 and 2.3/100,000.

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=2,736, females N=859).

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 19 women died from HN cancer. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 0.82. Though, the value of this parameter may vary with an underlying probability of 99% between 0.42 and 1.44, 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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