Munich Cancer Registry

- Survival
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ICD-10 C12, C13: Hypopharynx cancer

Incidence and Mortality

Year of diagnosis	1998-2016
Patients	1,697
Diseases	1,697
Creation date	08/21/2018
Export date	08/09/2018
Population	4.81 m

Munich Cancer Registry
Cancer Registry Bavaria - Upper Bavaria Regional Center
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Marchioninistr. 15
Munich, 81377
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https://www.tumorregister-muenchen.de/en

https://www.tumorregister-muenchen.de/en/facts/base/bC1213E-ICD-10-C12-C13-Hypopharynx-cancer-incidence-and-mortality.pdf

Index of figures and tables

Global Statements about the statistics on the Internet –
Baseline Statistics (grey button), **Survival** (red button)

In these analyses, the clinics and physicians of Upper Bavaria and the city and county of Landshut[#], with a total of 4.69 million inhabitants, account for the frequency of cancer diseases[##] and the achieved long term results. Additionally, the long term survival evaluated by the Munich Cancer Registry (MCR) is compared with the results of the population-based registry in the USA (SEER), which is useful for checking the consistency of the data on an international level.

In comparing several tables, inconsistent figures may be detected. This is based on the fact that different patient cohorts are included in the base calculation, for example when proportions of multiple tumors or DCO-cases[###] are concerned. In other cases the individual tumor diagnosis is the basis for calculation, for example with incidence.

The foot notes describe the currentness of the data. The baseline statistics and survival data are updated annually. This yearly analysis comprises the Annual Report of the MCR.

Clinics and physicians have access to essentially more detailed data, with which they can check, compare and in the best case optimize their own data and results.

We would be pleased to receive corrections, critique and useful suggestions. Just send an e-mail to tumor@ibe.med.uni-muenchen.de.

Munich Cancer Registry, August 2018

[#] 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).

[##] Due to the high frequency and good prognosis of non-malignant skin cancer (C44), no systematic ascertainment is performed for this diagnosis. C44 is not designated as a primary, but rather as a secondary tumor.

[###] DCO (death certificate only) identifies a cancer case that first becomes available to the MCR through the death certificate.

Some remarks regarding this cancer type

As a general rule, these few results from the TRM form the basis of sophisticated analyses. For head and neck tumors this is not the case. Therefore the results for head and neck tumors should be interpreted with caution. In part this is due to problems of classification because of limited specific details of locality. Additionally, with advanced tumors in a close topographic location it is often not possible to determine the exact ICD localization of a tumor.

ICD-10 codes (ICD-10 2015) used for specifying cancer site

Code	Description
C12	Malignant neoplasm of piriform sinus
C13.-	Malignant neoplasm of hypopharynx
C13.0	Postcricoid region
C13.1	Aryepiglottic fold, hypopharyngeal aspect
C13.2	Posterior wall of hypopharynx
C13.8	Overlapping lesion of hypopharynx
C13.9	Hypopharynx, unspecified

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	61			8.2	12.3	91.8	98.4
1999	68	5	7.4	13.2	12.1	88.2	98.5
2000	66	2	3.0	11.3	11.9	90.9	97.0
2001	67	3	4.5	13.0	11.8	85.1	97.0
2002	92	4	4.3	11.9	11.9	89.1	97.8 #
2003	98	1	1.0	14.2	11.7	88.8	98.0
2004	83	2	2.4	14.4	11.5	90.4	100.0
2005	114	7	6.1	14.8	11.0	81.6	98.2
2006	99	3	3.0	14.3	10.0	79.8	100.0
2007	123	7	5.7	14.9	9.8	80.5	91.9 #
2008	127	7	5.5	15.2	9.9	84.3	91.3
2009	118	4	3.4	15.2	9.2	80.5	89.0
2010	112	6	5.4	15.6	8.6	74.1	85.7
2011	103	4	3.9	16.3	7.8	74.8	91.3
2012	88	5	5.7	16.6	7.7	75.0	87.5
2013	94	1	1.1	16.7	8.2	66.0	86.2
2014	85	1	1.2	17.0	7.3	48.2	87.1
2015	56	3	5.4	17.6	4.2	51.8	96.4
2016	43	7	16.3	17.7	2.4	39.5	67.4 ##
1998-2016	1697	72	4.2	17.7	12.3	78.1	92.8

1,697 cases diagnosed 1998-2016 are related to a total of 1,697 patients. Currently, in 514 (30.3 %) of these 1,697 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 379 / 99 / 36 (22.3 % / 5.8 % / 2.1 %) 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 retreived from the respective headings.

How to interpret:
In 2014, a subgroup of 85 cases has been diagnosed, of which 17.0 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 7.3 % 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	56	91.8			7.1	12.7	91.1	98.2
1999	62	91.2	5	8.1	12.7	12.6	90.3	100.0
2000	59	89.4	2	3.4	10.7	12.4	91.5	98.3
2001	60	89.6	2	3.3	12.7	12.3	85.0	98.3
2002	85	92.4	4	4.7	10.9	12.6	88.2	97.6 #
2003	91	92.9	1	1.1	13.8	12.4	90.1	100.0
2004	73	88.0	2	2.7	14.4	12.2	89.0	100.0
2005	99	86.8	5	5.1	14.5	11.6	82.8	98.0
2006	87	87.9	3	3.4	13.8	11.0	81.6	100.0
2007	106	86.2	6	5.7	14.1	10.8	83.0	92.5 #
2008	107	84.3	6	5.6	14.5	10.9	84.1	90.7
2009	101	85.6	3	3.0	14.3	10.3	81.2	91.1
2010	100	89.3	5	5.0	14.8	9.7	75.0	86.0
2011	90	87.4	2	2.2	15.4	8.9	73.3	90.0
2012	75	85.2	4	5.3	15.5	8.8	74.7	85.3
2013	80	85.1			15.6	9.3	66.3	88.8
2014	71	83.5	1	1.4	16.0	8.8	49.3	87.3
2015	46	82.1	1	2.2	16.6	5.0	50.0	95.7
2016	37	86.0	5	13.5	16.8	2.9	35.1	67.6 ##
1998-2016	1485	87.5	57	3.8	16.8	12.7	78.7	93.3

1,485 cases diagnosed 1998-2016 are related to a total of 1,485 patients. Currently, in 440 (29.6 %) of these 1,485 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 324 / 85 / 31 (21.8 % / 5.7 % / 2.1 %) 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 retreived from the respective headings.

How to interpret:
In 2014, a subgroup of 71 cases has been diagnosed, of which 16.0 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 8.8 % 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	5	8.2			20.0	9.3	100.0	100.0	
1999	6	8.8			18.2	9.0	66.7	83.3	
2000	7	10.6			16.7	8.8	85.7	85.7	
2001	7	10.4	1	14.3	16.0	8.6	85.7	85.7	
2002	7	7.6			21.9	7.8	100.0	100.0	#
2003	7	7.1			17.9	7.4	71.4	71.4	
2004	10	12.0			14.3	7.1	100.0	100.0	
2005	15	13.2	2	13.3	17.2	7.0	73.3	100.0	
2006	12	12.1			18.4	4.2	66.7	100.0	
2007	17	13.8	1	5.9	21.5	4.5	64.7	88.2	#
2008	20	15.7	1	5.0	21.2	4.2	85.0	95.0	
2009	17	14.4	1	5.9	22.3	3.1	76.5	76.5	
2010	12	10.7	1	8.3	21.8	2.5	66.7	83.3	
2011	13	12.6	2	15.4	23.2	1.4	84.6	100.0	
2012	13	14.8	1	7.7	25.0	1.8	76.9	100.0	
2013	14	14.9	1	7.1	24.2	2.3	64.3	71.4	
2014	14	16.5			24.5	0.0	42.9	85.7	
2015	10	17.9	2	20.0	24.3	0.0	60.0	100.0	
2016	6	14.0	2	33.3	24.5	0.0	66.7	66.7	##
1998-2016	212	12.5	15	7.1	24.5	9.3	74.1	89.6	

212 cases diagnosed 1998-2016 are related to a total of 212 patients. Currently, in 74 (34.9 %) of these 212 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 55 / 14 / 5 (25.9 % / 6.6 % / 2.4 %) 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 retreived from the respective headings.

How to interpret:
In 2014, a subgroup of 14 cases has been diagnosed, of which 24.5 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 0.0 % 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	56	5	5.1	0.4	3.3	0.2	4.5	0.2	4.8	0.3
1999	62	6	5.5	0.5	3.7	0.3	5.1	0.4	5.7	0.5
2000	59	7	5.2	0.6	3.5	0.3	4.9	0.4	5.4	0.5
2001	60	7	5.2	0.6	3.5	0.4	4.7	0.6	5.1	0.6
2002	85	7	4.6	0.4	3.0	0.2	4.1	0.3	4.3	0.3
2003	91	7	4.9	0.4	3.2	0.2	4.5	0.3	4.7	0.3
2004	73	10	3.9	0.5	2.6	0.3	3.5	0.4	3.7	0.4
2005	99	15	5.2	0.8	3.4	0.4	4.5	0.6	5.1	0.7
2006	87	12	4.5	0.6	2.9	0.4	4.0	0.5	4.4	0.5
2007	106	17	4.8	0.7	2.9	0.5	4.0	0.7	4.5	0.7
2008	107	20	4.8	0.9	3.0	0.5	4.1	0.6	4.5	0.7
2009	101	17	4.5	0.7	2.7	0.4	3.8	0.6	4.2	0.6
2010	100	12	4.4	0.5	2.7	0.3	3.7	0.4	4.1	0.4
2011	90	13	4.0	0.6	2.2	0.3	3.2	0.4	3.7	0.5
2012	75	13	3.3	0.6	1.8	0.3	2.5	0.4	3.0	0.5
2013	80	14	3.5	0.6	2.0	0.3	2.8	0.5	3.1	0.5
2014	71	14	3.0	0.6	1.8	0.3	2.5	0.5	2.8	0.5
2015	46	10	1.9	0.4	1.1	0.2	1.5	0.3	1.8	0.3
2016	37	6	1.5	0.2	0.9	0.1	1.2	0.2	1.4	0.2
1998-2016	1485	212	4.0	0.6	2.5	0.3	3.4	0.4	3.8	0.5

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	Mean	Std. dev.	Min.	Max.	10%	25%	Median 50%	75%	90%
1998	61	59.4	9.2	37.3	86.7	48.6	54.0	58.1	64.5	70.7
1999	68	59.4	10.1	44.2	87.0	49.6	51.2	56.9	64.5	75.6
2000	66	59.4	10.2	43.1	88.6	49.3	52.1	57.6	65.3	78.8
2001	67	59.0	8.6	29.2	80.9	48.3	53.3	58.2	65.5	69.9
2002	92	58.8	8.4	39.2	77.7	47.0	52.7	58.5	64.4	68.8
2003	98	58.9	9.2	39.6	81.2	47.1	52.8	57.4	66.1	72.6
2004	83	58.5	9.8	38.5	87.8	47.0	52.0	58.9	63.9	69.4
2005	114	60.9	9.5	45.8	84.8	48.1	53.4	61.9	67.4	72.0
2006	99	60.2	9.7	30.6	86.2	49.1	54.5	58.8	66.4	72.1
2007	123	61.5	9.9	30.1	86.0	49.1	53.7	62.6	67.3	74.7
2008	127	62.6	9.8	35.5	91.4	48.6	57.6	61.7	68.3	74.1
2009	118	62.1	9.8	42.7	87.9	49.6	54.1	62.0	69.6	72.9
2010	112	60.2	10.8	35.1	92.3	46.7	52.1	59.5	68.7	73.3
2011	103	64.1	10.2	40.6	91.6	50.0	57.2	64.2	71.8	75.7
2012	88	64.9	10.9	39.9	91.7	48.6	58.5	64.5	73.1	78.3
2013	94	64.1	9.1	44.9	86.3	52.2	55.4	64.0	70.9	75.7
2014	85	63.5	9.8	33.5	84.8	49.0	57.5	64.3	69.8	74.8
2015	56	66.6	10.9	39.9	95.0	54.2	59.5	66.9	74.2	79.2
2016	43	65.3	11.8	38.8	91.6	54.5	56.7	64.4	74.3	77.6
1998-2016	1697	61.5	10.1	29.2	95.0	48.8	54.1	61.1	68.3	74.7

Table 3a

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

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	10%	25%	Median 50%	75%	90%
1998	56	58.2	7.8	37.3	76.7	47.6	53.7	57.6	63.4	68.9
1999	62	59.3	10.3	44.2	87.0	49.6	51.1	56.9	64.8	74.6
2000	59	58.8	9.8	45.2	88.6	49.3	51.2	57.2	64.3	71.2
2001	60	59.4	8.9	29.2	80.9	48.8	53.2	59.5	65.8	70.0
2002	85	58.4	8.2	39.2	77.7	47.0	52.4	57.7	64.0	68.4
2003	91	59.0	9.0	39.6	81.2	48.4	52.9	57.4	66.2	71.4
2004	73	57.4	9.4	38.5	83.9	46.2	51.1	57.1	63.5	66.8
2005	99	60.5	9.5	45.8	84.8	47.7	53.0	61.6	67.4	70.5
2006	87	59.8	9.6	30.6	85.0	48.9	54.5	58.6	66.4	72.1
2007	106	62.1	9.8	41.0	86.0	49.3	53.7	64.0	67.9	76.3
2008	107	61.8	8.8	40.7	84.5	48.6	56.1	61.5	67.9	71.8
2009	101	61.9	9.8	42.7	87.9	49.6	54.0	61.6	69.0	72.7
2010	100	60.1	10.5	38.7	92.3	46.5	52.3	59.5	68.4	73.5
2011	90	63.9	10.3	40.6	86.3	49.2	56.2	64.5	71.8	75.6
2012	75	65.0	11.2	39.9	91.7	47.7	56.0	65.1	73.9	78.3
2013	80	64.3	9.0	47.5	86.3	52.8	55.7	64.0	71.6	75.7
2014	71	63.9	9.2	44.6	84.8	50.1	57.9	64.3	70.0	74.8
2015	46	66.1	10.2	47.0	94.6	54.2	58.6	66.7	74.3	78.9
2016	37	65.8	11.2	41.3	91.6	54.9	57.8	64.4	74.3	77.6
1998-2016	1485	61.2	9.9	29.2	94.6	48.6	53.9	60.9	68.1	74.5

Table 3b

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

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	10%	25%	Median 50%	75%	90%
1998	5	73.4	12.9	59.4	86.7	59.4	60.7	75.4	84.9	86.7
1999	6	59.7	9.1	51.2	75.6	51.2	53.1	57.9	62.6	75.6
2000	7	63.9	13.5	43.1	81.3	43.1	56.9	60.4	79.9	81.3
2001	7	55.0	4.1	47.3	60.0	47.3	53.8	55.1	57.5	60.0
2002	7	63.9	9.4	45.5	73.0	45.5	60.5	66.0	71.6	73.0
2003	7	57.2	12.7	43.6	79.8	43.6	44.7	57.4	65.6	79.8
2004	10	66.9	9.5	56.5	87.8	57.7	60.3	64.8	71.4	82.0
2005	15	64.0	9.6	47.8	81.5	51.5	57.6	64.3	68.5	77.5
2006	12	62.8	10.3	51.6	86.2	52.7	54.4	60.8	70.7	71.5
2007	17	57.9	9.8	30.1	68.0	44.6	54.0	59.8	63.1	67.6
2008	20	66.7	13.2	35.5	91.4	52.7	60.6	66.5	72.5	86.6
2009	17	63.7	9.6	46.5	79.9	49.3	57.7	64.7	70.7	74.4
2010	12	60.3	13.4	35.1	82.4	48.8	49.6	62.7	69.6	71.8
2011	13	65.7	10.0	54.5	91.6	57.2	58.6	62.8	67.7	75.7
2012	13	64.7	9.5	52.5	90.6	54.4	60.3	63.9	67.4	71.3
2013	14	62.9	9.6	44.9	78.5	50.6	53.8	64.4	69.7	73.2
2014	14	61.4	12.5	33.5	84.1	48.3	52.2	63.0	69.3	74.1
2015	10	68.8	14.3	39.9	95.0	52.0	64.4	67.0	72.0	89.7
2016	6	62.4	15.7	38.8	82.9	38.8	54.4	63.4	71.6	82.9
1998-2016	212	63.3	11.2	30.1	95.0	49.8	57.1	62.9	69.3	77.5

Table 4

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

Age at diagnosis Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
0-4									
5-9									
10-14									
15-19									
20-24									
25-29									
30-34	2	0.2	0.2			0.0	2	1.5	1.5
35-39	7	0.7	0.9	3	0.4	0.4	4	2.9	4.4
40-44	24	2.5	3.5	22	2.7	3.1	2	1.5	5.9
45-49	70	7.4	10.9	61	7.5	10.6	9	6.6	12.5
50-54	117	12.3	23.2	104	12.8	23.4	13	9.6	22.1
55-59	135	14.2	37.4	120	14.8	38.1	15	11.0	33.1
60-64	180	19.0	56.4	151	18.6	56.7	29	21.3	54.4
65-69	178	18.8	75.1	148	18.2	74.9	30	22.1	76.5
70-74	123	13.0	88.1	105	12.9	87.8	18	13.2	89.7
75-79	71	7.5	95.6	67	8.2	96.1	4	2.9	92.6
80-84	26	2.7	98.3	22	2.7	98.8	4	2.9	95.6
85+	16	1.7	100.0	10	1.2	100.0	6	4.4	100.0
All ages	949	100.0		813	100.0		136	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=33 %	Females DCO rate n=12 %	Males Prop.all cancers n=113978 %	Females Prop.all cancers n=112253 %
0- 4								
5- 9								
10-14								
15-19								
20-24								
25-29								
30-34		2		0.1				0.1
35-39	3	4	0.2	0.3		25.0	0.2	0.2
40-44	22	2	1.2	0.1	4.5		1.0	0.0
45-49	61	9	3.1	0.5	3.3		1.6	0.1
50-54	104	13	6.0	0.8	2.9		1.7	0.1
55-59	120	15	8.5	1.0	4.2	6.7	1.3	0.2
60-64	151	29	12.3	2.2	0.7	10.3	1.1	0.3
65-69	148	30	12.5	2.3	2.7	3.3	0.8	0.2
70-74	105	18	9.5	1.4	6.7	11.1	0.5	0.1
75-79	67	4	8.4	0.4	3.0		0.4	0.0
80-84	22	4	4.8	0.6	9.1	50.0	0.2	0.0
85+	10	6	3.3	0.8	60.0	33.3	0.1	0.0
All ages	813	136			4.1	8.8	0.7	0.1
Incidence								
Raw			3.6	0.6				
WS			2.1	0.3				
ES			2.9	0.4				
BRD-S			3.3	0.5				

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

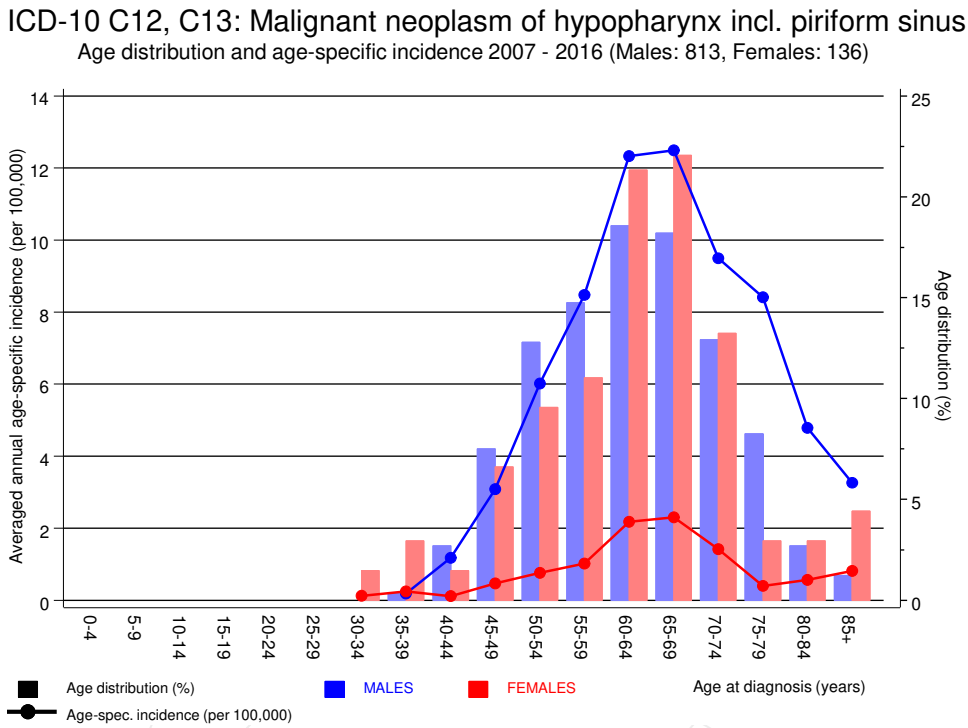


Figure 6. Age distribution (males: mean=63.0 yrs, median=63.2 yrs; females: mean=63.4 yrs, median=64.3 yrs) and age-specific incidence.

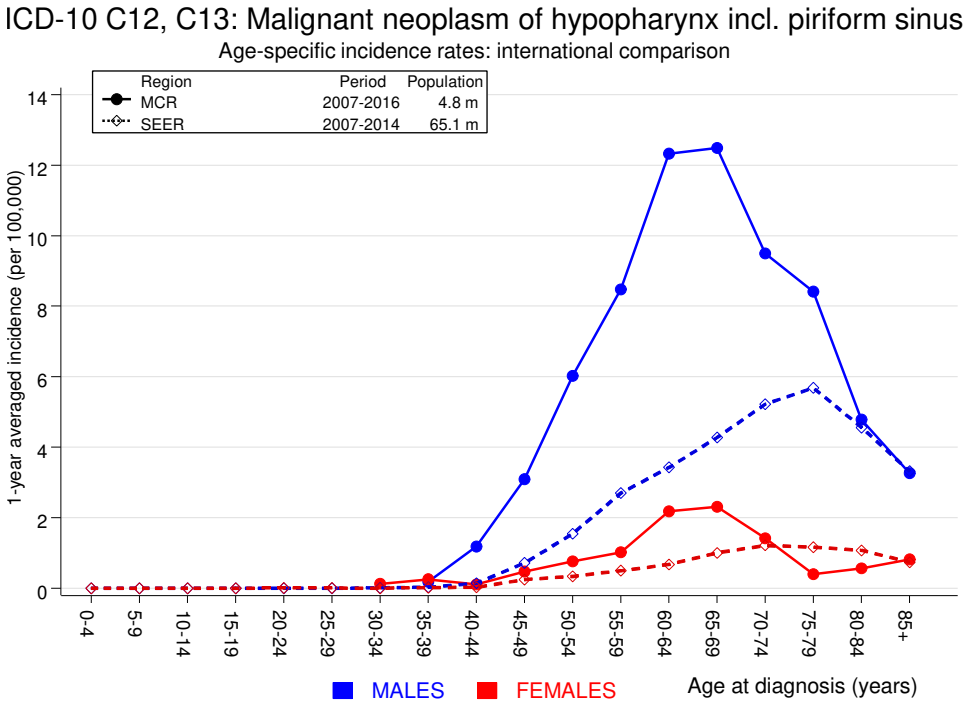


Figure 6a. Age-specific incidence in MCR registry areas compared to SEER (Surveillance, Epidemiology, and End Results, USA).

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	22	0.6	39.9	25.0	60.4	#	59.0	13.6
C09–C10	Oropharynx	35	0.7	48.5	33.8	67.4	#	94.3	
C14	ENT cancer	2	0.0	170.2	20.6	614.9	#	5.5	100.0
C15	Oesophagus	35	1.0	35.4	24.6	49.2	#	93.6	11.4
C16	Stomach	4	1.6	2.6	0.7	6.5		6.7	
C18	Colon	5	3.8	1.3	0.4	3.1		3.3	
C19–C20	Rectum	5	2.6	2.0	0.6	4.6		6.7	
C22	Liver	9	1.3	6.9	3.2	13.1	#	21.2	
C25	Pancreas	5	1.5	3.2	1.1	7.6	#	9.5	20.0
C32	Larynx	8	0.6	13.8	6.0	27.2	#	20.4	
C33–C34	Lung	69	5.5	12.6	9.8	15.9	#	174.8	11.6
C43	Malign. melanoma	5	2.1	2.4	0.8	5.6		8.0	40.0
C61	Prostate	17	12.7	1.3	0.8	2.1		11.7	11.8
C64	Kidney	4	1.7	2.4	0.6	6.1		6.4	50.0
C65	Renal pelvis	2	0.2	12.2	1.5	44.2	#	5.1	
C67	Bladder	5	1.6	3.1	1.0	7.2	#	9.3	
C73	Thyroid	3	0.4	7.2	1.5	21.2	#	7.1	33.3
Others, specified		8	3.2	2.5	1.1	4.9	#	13.2	12.5
Not observed		0	3.9	0.0	0.0	0.9	#	−10.7	
All further malignancies		243	44.9	5.4	4.7	6.1	#	545.0	10.7

Patients	1420
Median age at next malignancy (years)	64.3
Person-years	3634
Mean observation time (years)	2.6
Median observation time (years)	1.4

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

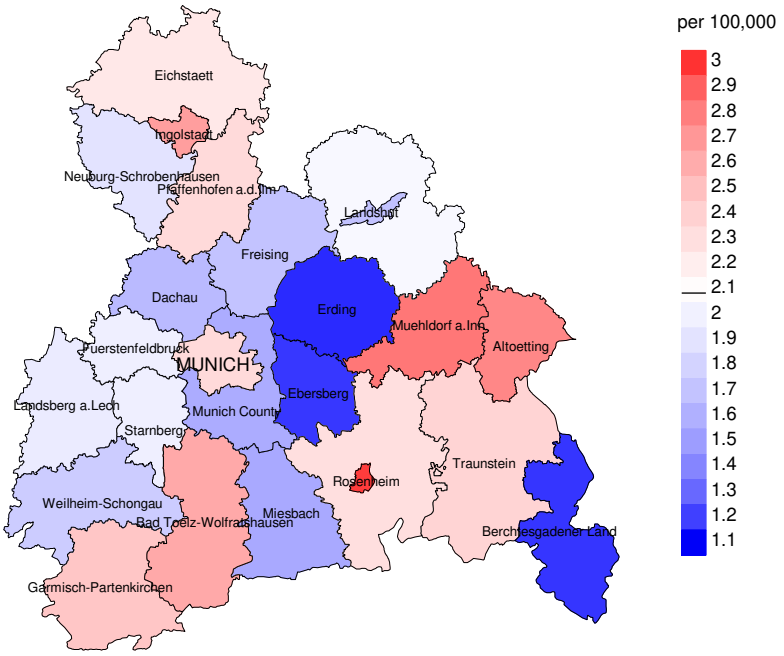
Diagnosis		Observed n	Expected n	SIR	CI 95%	CI 95%		EAR	DCO %
C09–C10	Oropharynx	8	0.0	261.1	112.7	514.5	#	144.9	
C15	Oesophagus	5	0.0	130.8	42.5	305.4	#	90.2	
C18	Colon	2	0.4	5.2	0.6	18.7		29.4	
C22	Liver	3	0.1	54.2	11.2	158.4	#	53.5	33.3
C33–C34	Lung	8	0.4	18.3	7.9	36.1	#	137.5	25.0
C50	Breast	5	1.8	2.7	0.9	6.4		57.6	
C51	Vulva	2	0.0	48.3	5.9	174.6	#	35.6	
C91–C96	Leukaemia	2	0.1	30.2	3.7	109.0	#	35.2	50.0
Others, specified		5	0.3	16.2	5.3	37.9	#	85.3	20.0
Not observed		0	2.0	0.0	0.0	1.8		−36.8	
All further malignancies		40	5.2	7.7	5.5	10.4	#	632.4	12.5

Patients	201
Median age at next malignancy (years)	67.2
Person-years	550
Mean observation time (years)	2.7
Median observation time (years)	1.0

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

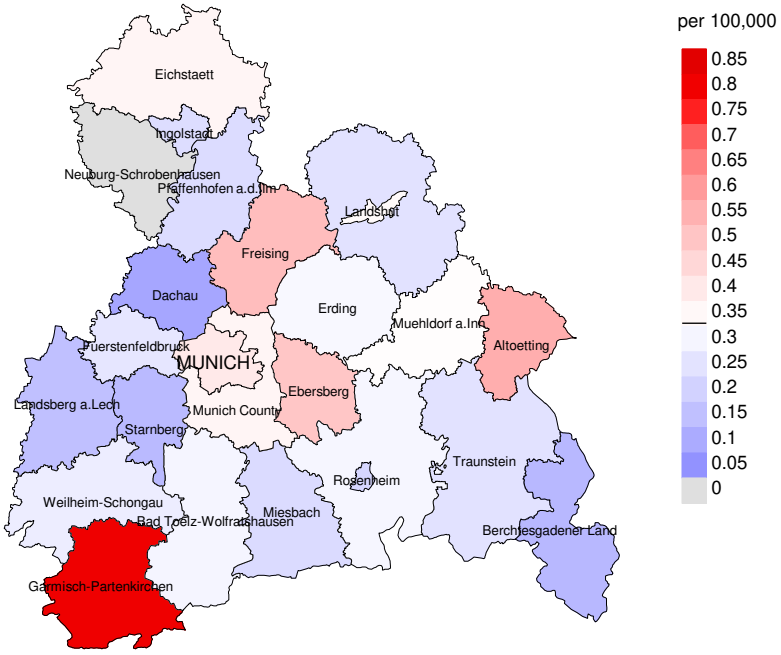
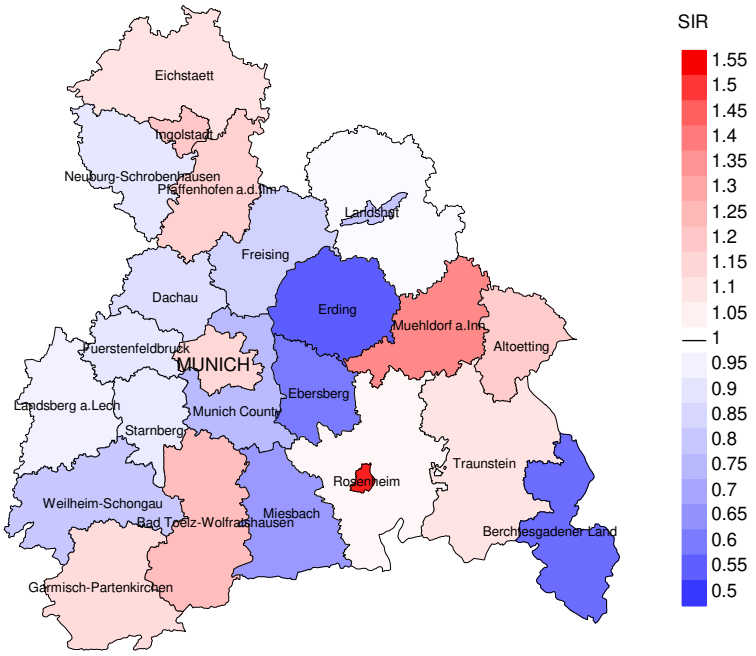


Figure 8a. Map of cancer incidence (world standard population, incl. DCO cases) by county averaged for period 2007 to 2016. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 2.1/100,000 WS N=813, females 0.3/100,000 WS N=136).

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 6 women were identified with newly diagnosed hypopharynx cancer. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 0.5/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.1 and 1.6/100,000.

Standardized incidence ratio (SIR) 2007 - 2016: Males



Standardized incidence ratio (SIR) 2007 - 2016: Females

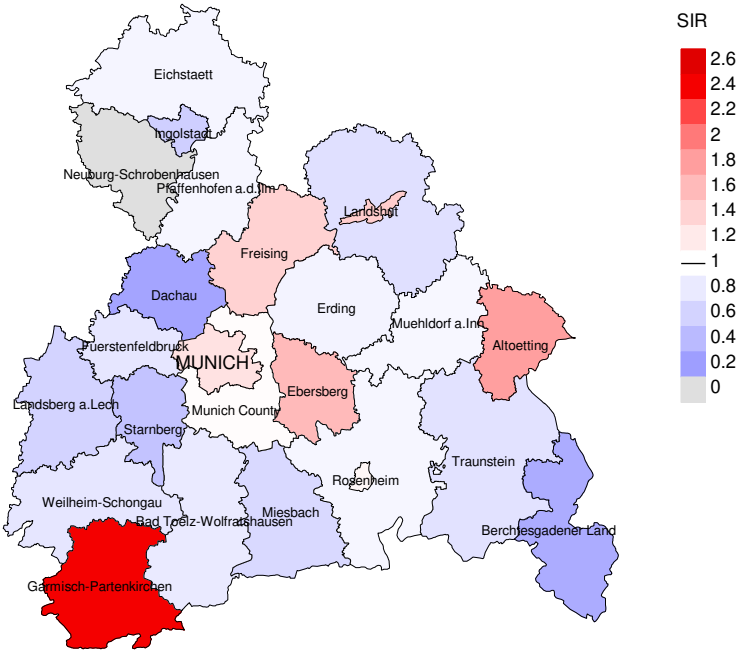


Figure 8b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2016. According to their individual SIR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=813, females N=136).

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 6 women were identified with newly diagnosed hypopharynx cancer. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 1.60. Though, the value of this parameter may vary with an underlying probability of 99% between 0.41 and 4.17, 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	61	98.4		56	91.8	98.2
1999	68	98.5	7.4	60	88.2	95.0
2000	66	97.0	3.0	60	90.9	91.7
2001	67	97.0	4.5	57	85.1	98.2
2002	92	97.8	4.3	82	89.1	95.1
2003	98	98.0	1.0	87	88.8	96.6
2004	83	100.0	2.4	75	90.4	93.3
2005	114	98.2	6.1	93	81.6	97.8
2006	99	100.0	3.0	79	79.8	98.7
2007	123	91.9	5.7	99	80.5	96.0
2008	127	91.3	5.5	107	84.3	98.1
2009	118	89.0	3.4	95	80.5	96.8
2010	112	85.7	5.4	83	74.1	98.8
2011	103	91.3	3.9	77	74.8	93.5
2012	88	87.5	5.7	66	75.0	95.5
2013	94	86.2	1.1	62	66.0	100.0
2014	85	87.1	1.2	41	48.2	97.6
2015	56	96.4	5.4	29	51.8	93.1
2016	43	67.4	16.3	17	39.5	76.5
1998-2016	1697	92.8	4.2	1325	78.1	96.2

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	61	45	88.9	13	21.3
1999	68	61	91.8	17	25.0
2000	66	50	96.0	11	16.7
2001	67	55	87.3	10	14.9
2002	92	68	98.5	18	19.6
2003	98	76	96.1	12	12.2
2004	83	84	95.2	16	19.3
2005	114	66	95.5	19	16.7
2006	99	96	99.0	23	23.2
2007	123	116	99.1	27	22.0
2008	127	102	98.0	28	22.0
2009	118	92	98.9	20	16.9
2010	112	98	99.0	23	20.5
2011	103	93	96.8	22	21.4
2012	88	113	95.6	25	28.4
2013	94	83	98.8	16	17.0
2014	85	89	96.6	17	20.0
2015	56	88	97.7	19	33.9
2016	43	59	100.0	13	30.2
1998-2016	1697	1534	96.7	349	20.6

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	45	80.0	20.0	95.0
1999	61	80.3	19.7	96.4
2000	50	84.0	16.0	93.8
2001	55	80.0	20.0	89.6
2002	68	89.7	10.3	98.5
2003	76	86.8	13.2	97.3
2004	84	82.1	17.9	91.3
2005	66	89.4	10.6	95.2
2006	96	88.5	11.5	93.7
2007	116	85.3	14.7	93.9
2008	102	89.2	10.8	96.0
2009	92	82.6	17.4	96.7
2010	98	88.8	11.2	94.8
2011	93	79.6	20.4	85.6
2012	113	83.2	16.8	93.5
2013	83	86.7	13.3	93.9
2014	89	80.9	19.1	90.7
2015	88	83.0	17.0	93.0
2016	59	71.2	28.8	88.1
1998-2016	1534	84.2	15.8	93.5

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	38	57.9	56.5	63.2	58.6
1999	54	58.8	58.8	60.2	58.8
2000	47	59.7	58.8	64.0	59.4
2001	47	58.4	56.5	68.9	57.8
2002	62	59.7	59.7	59.8	59.7
2003	69	63.7	63.6	67.1	63.6
2004	75	60.1	59.8	62.9	60.0
2005	62	62.4	62.7	54.1	62.7
2006	86	62.7	61.6	67.1	62.5
2007	99	62.9	61.9	64.4	62.0
2008	86	64.3	63.5	66.7	64.8
2009	77	65.2	65.3	62.4	65.3
2010	91	62.4	61.5	72.3	61.8
2011	83	65.4	65.2	69.4	65.4
2012	101	65.9	65.8	68.9	65.8
2013	70	66.0	66.0	65.9	65.2
2014	77	66.4	65.6	70.4	65.9
2015	72	65.4	65.0	67.3	64.9
2016	52	68.9	67.7	72.0	69.8
1998-2016	1348	63.2	62.7	66.5	63.0

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

Table 10b

Medians of age at death according to the grouping in Table 9
FEMALES

Year of death	Deaths n	Age at death (all causes) Years	Age at death (cancer-related) Years	Age at death (non-cancer-related) Years	Age at death (according to death certificate) Years
1998	7	67.4	62.0	85.2	67.4
1999	7	62.2	62.9	54.4	62.6
2000	3	54.2	54.2		54.2
2001	8	61.5	60.9	63.2	61.4
2002	6	68.6	66.2	73.8	68.6
2003	7	59.9	59.9		59.9
2004	9	67.7	74.7	65.4	75.7
2005	4	68.4	60.0	69.9	69.3
2006	10	65.6	65.6		65.6
2007	17	67.0	63.1	71.0	67.0
2008	16	64.6	66.3	61.9	64.7
2009	15	68.7	68.6	70.2	69.5
2010	7	62.0	61.2	81.5	62.0
2011	10	62.1	62.1	65.3	60.9
2012	12	69.3	69.3		69.3
2013	13	68.1	68.1	71.4	68.1
2014	12	67.6	68.9	61.2	68.3
2015	16	65.1	64.4	65.8	65.8
2016	7	70.5	74.0	69.3	70.5
1998-2016	186	67.0	66.6	67.6	67.4

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	30	2.7	0.54	1.7	0.53	2.4	0.54	2.7	0.56
1999	44	3.9	0.71	2.5	0.67	3.5	0.68	3.8	0.67
2000	39	3.4	0.66	2.2	0.63	3.2	0.65	3.7	0.68
2001	38	3.3	0.63	2.2	0.63	3.1	0.66	3.4	0.67
2002	56	3.0	0.66	1.9	0.64	2.7	0.65	2.9	0.67
2003	59	3.1	0.65	1.9	0.59	2.6	0.59	3.0	0.63
2004	62	3.3	0.85	2.1	0.82	3.0	0.85	3.1	0.84
2005	57	3.0	0.58	1.8	0.54	2.5	0.56	2.9	0.57
2006	75	3.9	0.86	2.4	0.84	3.4	0.85	3.8	0.87
2007	84	3.8	0.79	2.3	0.81	3.2	0.81	3.6	0.80
2008	77	3.5	0.72	2.0	0.67	2.9	0.69	3.3	0.72
2009	66	3.0	0.65	1.7	0.62	2.4	0.63	2.8	0.67
2010	81	3.6	0.81	2.2	0.80	3.0	0.81	3.4	0.83
2011	66	2.9	0.73	1.7	0.76	2.4	0.74	2.7	0.72
2012	82	3.6	1.09	1.9	1.05	2.8	1.09	3.3	1.11
2013	61	2.7	0.76	1.4	0.73	2.0	0.74	2.4	0.76
2014	64	2.7	0.90	1.5	0.86	2.1	0.87	2.5	0.91
2015	60	2.5	1.30	1.4	1.30	2.0	1.31	2.3	1.31
2016	38	1.6	1.03	0.9	1.05	1.3	1.03	1.5	1.06
1998-2016	1139	3.1	0.77	1.8	0.74	2.6	0.75	2.9	0.77

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	6	0.5	1.20	0.3	1.92	0.4	1.66	0.4	1.30
1999	5	0.4	0.83	0.2	0.60	0.3	0.64	0.4	0.76
2000	3	0.2	0.43	0.2	0.49	0.2	0.48	0.2	0.45
2001	6	0.5	0.86	0.3	0.63	0.3	0.62	0.4	0.79
2002	5	0.3	0.71	0.1	0.66	0.2	0.71	0.2	0.70
2003	7	0.4	1.00	0.2	0.95	0.3	1.00	0.3	1.04
2004	7	0.4	0.70	0.2	0.69	0.2	0.67	0.3	0.73
2005	2	0.1	0.13	0.1	0.15	0.1	0.15	0.1	0.13
2006	10	0.5	0.83	0.2	0.68	0.3	0.65	0.4	0.71
2007	15	0.6	0.88	0.4	0.74	0.5	0.80	0.6	0.87
2008	14	0.6	0.70	0.3	0.71	0.4	0.71	0.5	0.70
2009	10	0.4	0.59	0.2	0.47	0.3	0.48	0.3	0.50
2010	6	0.3	0.50	0.2	0.60	0.2	0.59	0.2	0.54
2011	8	0.3	0.62	0.2	0.68	0.3	0.66	0.3	0.64
2012	12	0.5	0.92	0.2	0.75	0.4	0.79	0.4	0.81
2013	11	0.5	0.79	0.3	0.80	0.4	0.79	0.4	0.80
2014	8	0.3	0.57	0.2	0.50	0.2	0.52	0.3	0.54
2015	13	0.5	1.30	0.3	1.23	0.4	1.29	0.4	1.27
2016	4	0.2	0.67	0.1	0.44	0.1	0.50	0.1	0.60
1998-2016	152	0.4	0.72	0.2	0.67	0.3	0.68	0.3	0.69

Table 12

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

Age at death Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
0-4									
5-9									
10-14									
15-19									
20-24									
25-29									
30-34	1	0.1	0.1			0.0	1	1.0	1.0
35-39	3	0.4	0.5	1	0.1	0.1	2	2.0	3.0
40-44	9	1.2	1.7	9	1.3	1.5			3.0
45-49	36	4.6	6.3	35	5.2	6.6	1	1.0	4.0
50-54	81	10.4	16.7	72	10.6	17.2	9	8.9	12.9
55-59	121	15.5	32.2	111	16.3	33.6	10	9.9	22.8
60-64	149	19.1	51.3	128	18.9	52.4	21	20.8	43.6
65-69	149	19.1	70.4	122	18.0	70.4	27	26.7	70.3
70-74	113	14.5	84.9	98	14.4	84.8	15	14.9	85.1
75-79	71	9.1	94.0	68	10.0	94.8	3	3.0	88.1
80-84	32	4.1	98.1	27	4.0	98.8	5	5.0	93.1
85+	15	1.9	100.0	8	1.2	100.0	7	6.9	100.0
All ages	780	100.0		679	100.0		101	100.0	

Table 13

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

Age at death Years	Males n	Females n	Males Age-spec. mortal.	Males MI-index	Females Age-spec. mortal.	Females MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4								
5- 9								
10-14								
15-19								
20-24								
25-29								
30-34		1			0.1	0.50		0.8
35-39	1	2	0.1	0.33	0.1	0.50	0.5	0.7
40-44	9		0.5	0.41			1.8	
45-49	35	1	1.8	0.57	0.1	0.11	3.0	0.1
50-54	72	9	4.2	0.69	0.5	0.69	3.5	0.5
55-59	111	10	7.8	0.93	0.7	0.67	3.3	0.4
60-64	128	21	10.4	0.85	1.6	0.72	2.6	0.6
65-69	122	27	10.3	0.82	2.1	0.90	1.7	0.5
70-74	98	15	8.9	0.93	1.2	0.83	1.1	0.2
75-79	68	3	8.5	1.01	0.3	0.75	0.8	0.0
80-84	27	5	5.9	1.23	0.7	1.25	0.4	0.1
85+	8	7	2.6	0.80	1.0	1.17	0.1	0.1
All ages	679	101					1.3	0.2
Mortality								
Raw			3.0	0.84	0.4	0.74		
WS			1.7	0.81	0.2	0.69		
ES			2.4	0.82	0.3	0.70		
BRD-S			2.7	0.84	0.4	0.72		
PYLL-70								
per 100,000			24.7		3.2			
ES			21.3		2.7			
AYLL-70			10.4		8.9			

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	66	13.2	34	51.5	8	12.1	24	36.4
C09–C10	Oropharynx	61	12.2	14	23.0	25	41.0	22	36.1
C12–C13	Hypopharynx	22	4.4			4	18.2	18	81.8
C15	Oesophagus	63	12.6	9	14.3	12	19.0	42	66.7
C16	Stomach	7	1.4	1	14.3			6	85.7
C18	Colon	14	2.8	9	64.3			5	35.7
C19–C20	Rectum	9	1.8	4	44.4	1	11.1	4	44.4
C22	Liver	12	2.4	1	8.3	2	16.7	9	75.0
C25	Pancreas	6	1.2	1	16.7	1	16.7	4	66.7
C33–C34	Lung	99	19.8	14	14.1	14	14.1	71	71.7
C44	Skin others	33	6.6	11	33.3	3	9.1	19	57.6
C61	Prostate	32	6.4	20	62.5	2	6.3	10	31.3
C64	Kidney	10	2.0	6	60.0	1	10.0	3	30.0
C67	Bladder	11	2.2	5	45.5			6	54.5
C76–C79	CUP	15	3.0	12	80.0			3	20.0
Others, specified		41	8.2	20	48.8	6	14.6	15	36.6
All further malignancies		501	100.0	161	32.1	79	15.8	261	52.1

Further malignancies with number of cases 1 to 5 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	11.2	9	90.0	1	10.0		
C07-C08	Salivary gland	1	1.1	1	100.0				
C09-C10	Oropharynx	9	10.1	3	33.3	4	44.4	2	22.2
C11	Nasopharynx	1	1.1			1	100.0		
C15	Oesophagus	9	10.1			4	44.4	5	55.6
C16	Stomach	3	3.4	1	33.3	1	33.3	1	33.3
C18	Colon	2	2.2	1	50.0			1	50.0
C19-C20	Rectum	1	1.1					1	100.0
C22	Liver	1	1.1					1	100.0
C30-C31	Sinuses	1	1.1					1	100.0
C32	Larynx	4	4.5	2	50.0	1	25.0	1	25.0
C33-C34	Lung	14	15.7			2	14.3	12	85.7
C44	Skin others	3	3.4					3	100.0
C50	Breast	14	15.7	9	64.3	2	14.3	3	21.4
C51	Vulva	2	2.2					2	100.0
C53	Cervix uteri	3	3.4	2	66.7			1	33.3
C54	Corpus uteri	3	3.4	1	33.3			2	66.7
C56	Ovary	1	1.1	1	100.0				
C70-C72	CNS cancer	1	1.1			1	100.0		
C73	Thyroid	3	3.4	2	66.7			1	33.3
C82-C85	NHL	1	1.1	1	100.0				
C91-C96	Leukaemia	2	2.2					2	100.0
All further malignancies		89	100.0	33	37.1	17	19.1	39	43.8

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		1			0.1	0.50		0.9
35-39								
40-44	9		0.5	0.45			2.0	
45-49	28	1	1.4	0.58	0.1	0.14	2.7	0.1
50-54	60	6	3.5	0.66	0.4	0.60	3.3	0.4
55-59	95	9	6.7	1.00	0.6	0.69	3.2	0.4
60-64	103	11	8.4	0.84	0.8	0.61	2.5	0.4
65-69	94	22	7.9	0.87	1.7	0.96	1.6	0.5
70-74	76	10	6.9	0.96	0.8	0.77	1.1	0.2
75-79	48	2	6.0	1.07	0.2	1.00	0.7	0.0
80-84	16	4	3.5	1.14	0.6	1.33	0.3	0.1
85+	7	4	2.3	1.00	0.5	1.33	0.1	0.1
All ages	536	70					1.3	0.2
Mortality								
Raw			2.3	0.85	0.3	0.73		
WS			1.4	0.82	0.2	0.66		
ES			1.9	0.83	0.2	0.68		
BRD-S			2.2	0.85	0.2	0.70		
PYLL-70								
per 100,000			20.4		2.1			
ES			17.6		1.7			
AYLL-70			10.6		8.3			

* See corresponding tables with multiple malignancies.

Table 16

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

Age at death Years	Males n	Females n	Males Age-spec. mortal.	Males MI-index	Females Age-spec. mortal.	Females MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4								
5- 9								
10-14								
15-19								
20-24								
25-29								
30-34		1			0.1	0.50		1.0
35-39								
40-44	7		0.4	0.47			1.5	
45-49	25		1.3	0.53			2.4	
50-54	52	5	3.0	0.63	0.3	0.50	2.9	0.3
55-59	83	9	5.9	0.97	0.6	0.69	2.9	0.4
60-64	81	9	6.6	0.71	0.7	0.53	2.0	0.3
65-69	72	17	6.1	0.75	1.3	0.74	1.3	0.4
70-74	54	7	4.9	0.87	0.6	0.64	0.8	0.1
75-79	30		3.8	0.73			0.5	
80-84	13	4	2.8	1.00	0.6	1.33	0.3	0.1
85+	6	3	2.0	0.86	0.4	1.00	0.1	0.0
All ages	423	55					1.1	0.2
Mortality								
Raw			1.9	0.75	0.2	0.60		
WS			1.1	0.73	0.1	0.56		
ES			1.5	0.74	0.2	0.58		
BRD-S			1.7	0.75	0.2	0.58		
PYLL-70								
per 100,000			17.3		1.7			
ES			14.9		1.5			
AYLL-70			10.9		8.5			

* See corresponding tables with multiple malignancies.

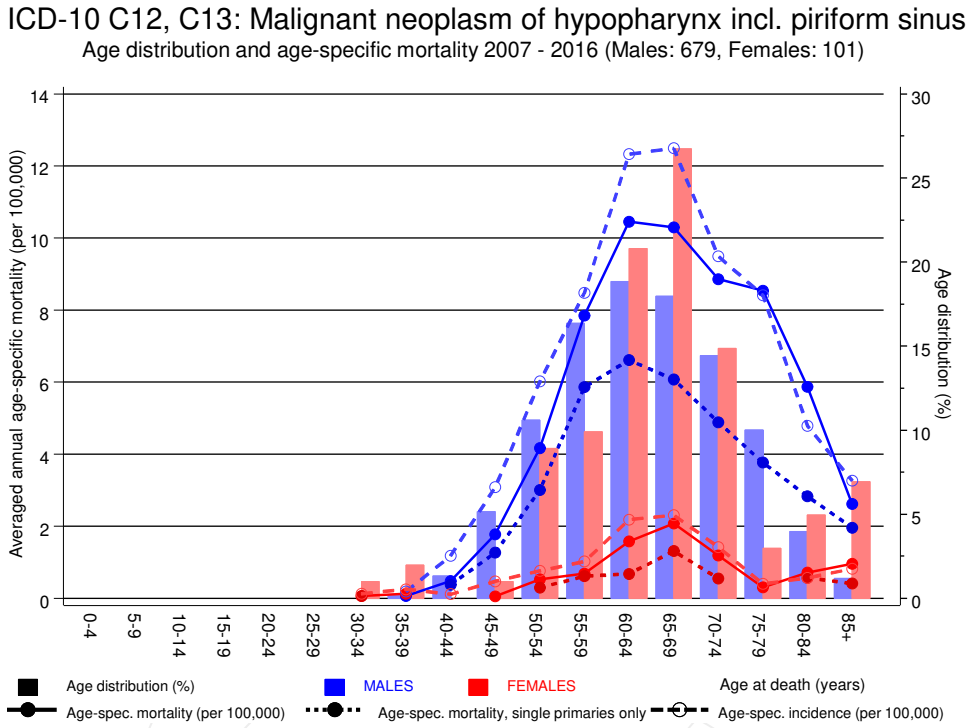


Figure 17. Distribution of age at death (bars; males: mean=61.4 yrs, median=61.1 yrs; females: mean=64.0 yrs, median=64.5 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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

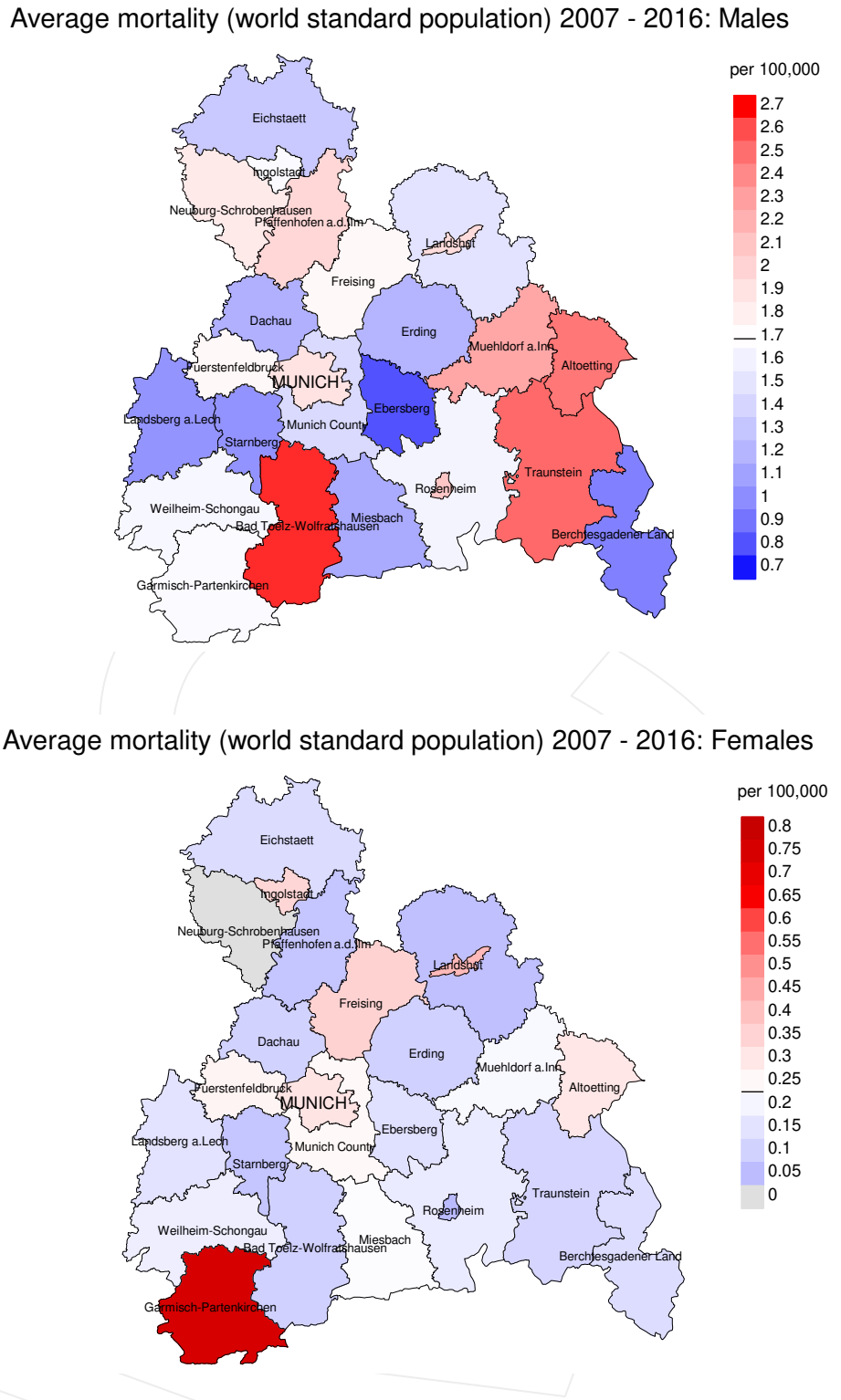
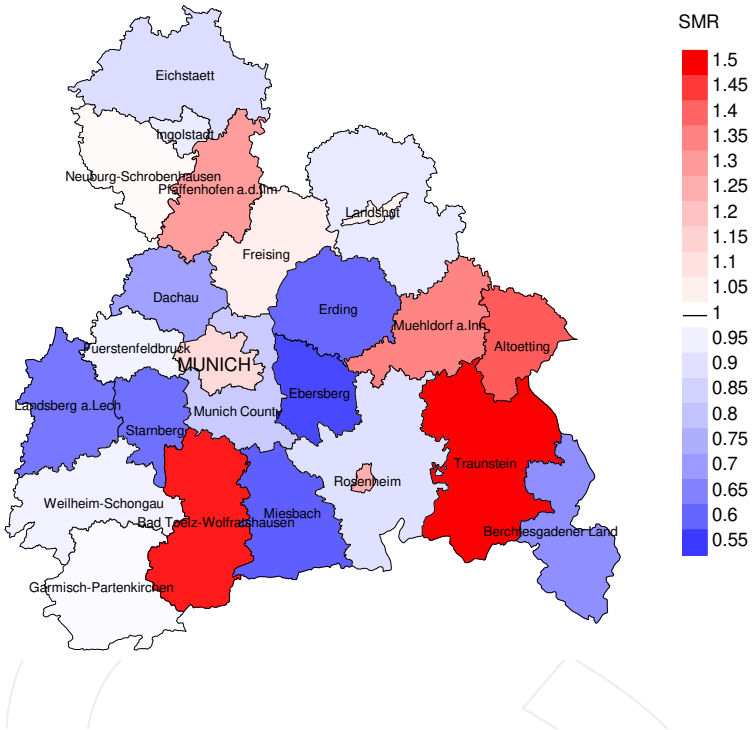


Figure 18a. Map of cancer mortality (world standard population) by county averaged for period 2007 to 2016. According to their individual mortality rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 1.7/100,000 WS N=679, females 0.2/100,000 WS N=101).

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 2 women died from hypopharynx cancer. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 0.1/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.0 and 1.1/100,000.

Standardized mortality ratio (SMR) 2007 - 2016: Males



Standardized mortality ratio (SMR) 2007 - 2016: Females

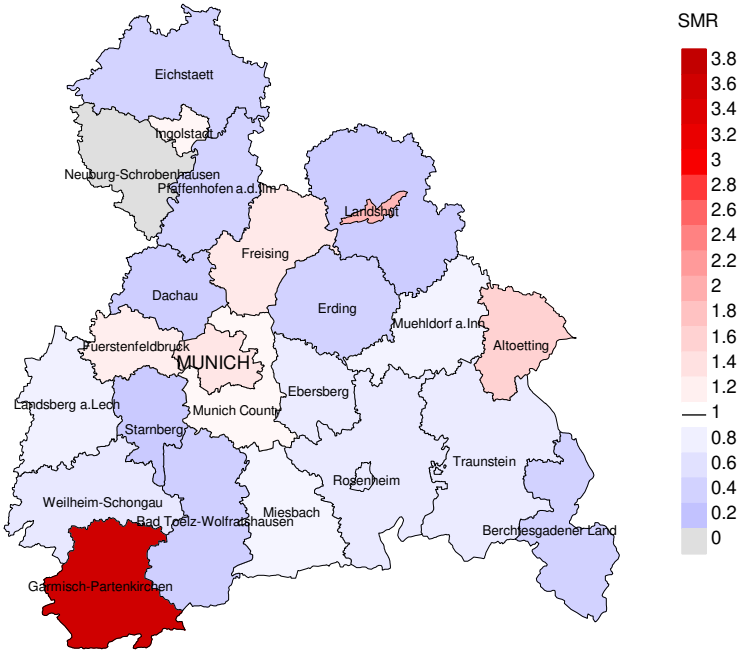


Figure 18b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2016. According to their individual SMR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=679, females N=101).

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 2 women died from hypopharynx cancer. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 0.73. Though, the value of this parameter may vary with an underlying probability of 99% between 0.04 and 3.37, 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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